

JPRS-UMA-93-003
26 January 1993



JPRS Report

Central Eurasia

Military Affairs
Defense Industry and Conversion

Central Eurasia

Military Affairs

Defense Industry and Conversion

JPRS-UMA-93-003

CONTENTS

26 January 1993

CONVERSION POLICY—GENERAL ISSUES

Bazhanov of State Conversion Committee Interviewed [VOYENNNYY VESTNIK No 7, Jul]	1
Glukhikh of Defense Industries' Committee Interviewed [KOMSOMOLSKAYA PRAVDA 3 Dec]	5
Regulation on Military-Technical Cooperation of the Russian Federation With Foreign Countries [FOREIGN TRADE No 6, 92]	8
Foreign Economic Activities of Enterprises Under Conversion [FOREIGN TRADE No 6, 92]	10
Note on Law on Conversion [FOREIGN TRADE No 6, 92]	11
Military Import-Export Company 'Spetsvneshtekhnika' [TEKHNIKA I VOORUZHENIYE No 9-10, Sep-Oct]	11
Missile Troops Subsidiary Industry [MOSCOW NEWS No 47, 22-29 Nov]	12
Vega-M' NPO's Effort to Deal with Conversion [PRAVDA 3 Dec]	13
Conversion May Lead to Loss of Sensitive Information [RABOCHAYA TRIBUNA 11 Dec]	14
Maley Press Conference on Nadezhda Joint-Stock Company [SELSKAYA ZHIZN 22 Dec]	15

INDIVIDUAL ENTERPRISE CONVERSION

Director of Arzamas-16 Interviewed [ROSSIYA No 41, 7-13 Oct]	16
Tula Small Arms Director Interviewed [KRASNAYA ZVEZDA 17 Dec]	21
Weapons Plutonium Plant Chief Interviewed on Conversion [EKONOMIKA I ZHIZN No 48, Nov]	24
Energia Combine Seeks Western Partners [Helsinki HELSINGIN SANOMAT 22 Nov]	25
Kirov Tank Plant Struggles for Survival [TRUD 2 Dec]	27
Petersburg Defense Plant Conversion to Agricultural Production [SELSKAYA ZHIZN 15 Dec]	28

ARMS SALES

LAND ARMS

Likhachev Converted Vehicles [TEKHNIKA I VOORUZHENIYE No 9-10, Sep-Oct]	29
New Family of KamAZ Trucks [TEKHNIKA I VOORUZHENIYE No 9-10, Sep-Oct]	29
GRM-126 Transporter [TEKHNIKA I VOORUZHENIYE No 9-10, Sep-Oct]	32
Sterlitamak Brings Out New Nuclear-Capable SP Artillery Piece [TRUD 5 Nov]	33
Arzamas Offers BTR-80, Derivative Civilian Vehicles [KRASNAYA ZVEZDA 16 Dec]	33

AEROSPACE SYSTEMS

Missile Conversion for Light-Satellite Launch [TEKHNIKA I VOORUZHENIYE No 9-10]	34
MiG Plant Contracts to Build Civilian Aircraft [ROSSIYSKIYE VESTI 24 Nov]	36
Hopes for Marketing RD-170 Rocket Engine Abroad [ROSSIYSKIYE VESTI 25 Nov]	37
Simonov Discusses Problems of Sukhoy Design Bureau [NEZAVISIMAYA GAZETA 17 Dec]	38

NAVAL SYSTEMS

Production of Naval Propulsion Systems at NPO 'Mashproyekt' [TEKHNIKA I VOORUZHENIYE No 9-10, Sep-Oct]	40
Conversion: Navigation Institute [NEVSKOYE VREMYA 20 Nov]	42

**Bazhanov of State Conversion Committee
Interviewed**

93UM0192A Moscow VOYENNNY VESTNIK
in Russian No 7, Jul 92 (signed to press
1 Jul 92) pp 2-6

[Interviews in February and May 1992 with Mikhail Nikolayevich Bazhanov, chairman of State Committee for Conversion, by VOYENNNY VESTNIK correspondents A. Lushnikov and V. Murakhovskiy, occasion and place not specified, under rubric "Pertinent Interview"; first paragraph is box insert]

[Text]

- Through the collapse of the defense complex to a "resurrection"?
- Chief engineer works... as watchman.

On an editorial assignment, our correspondents A. Lushnikov and V. Murakhovskiy met in February of this year with Mikhail Nikolayevich BAZHANOV, chairman of the State Committee for Conversion, and asked him to answer a number of questions directly affecting the interests of the defense industry and the Army. Instead of the planned 30 minutes, the conversation lasted over one and one-half hours. We became convinced that, in contrast to other numerous structures, the Committee is capable of giving real help to industry in turning toward people's needs. But there are more than enough problems, and the solution to many of them does not always depend on Bazhanov and his associates. By the way, judge for yourselves...

[VOYENNNY VESTNIK] Mikhail Nikolayevich! Could you tell the readers how the conversion program in our country is being fulfilled and where we are today?

[Bazhanov] Indeed, officials of the military-industrial complex prepared and put out a state conversion program in February 1990. Alas, it expired quietly, although the document was on a scale that was more than enough. The whole thing is that the program was being developed from above, but conversion tolerates no coercion. This is a purely creative thing, although what creativeness would there appear to be to remake tanks into samovars or refrigerators?

Diktat is almost impossible in conversion, except perhaps in special industries where it is easy to shift to putting out peaceful products—the aircraft industry, for example: instead of fighters they will begin making light aircraft for various purposes. Military industries with their single-product system which are engaged in manufacturing only howitzers or only APC's are quite another matter. It is practically impossible to convert them to the output of peaceful products right away. What is most important is that the state brought conversion down on defense sectors like an eruption of the volcano Krakatoa, and they were completely unprepared for it. They are not even ready today, five years after the beginning of so-called "perestroika."

Further, conversion is a very expensive thing. We had a whole series of talks with the Americans: U.S. Deputy Secretary of Defense Mr. Atwood arrived with presidents of very large American firms. He even joked during one of the talks that the holders of more capital than in the rest of America had assembled in my office, inasmuch as all his colleagues were billionaires. Well, in our mutual opinion conversion will cost Russia the same as for the United States, 150 billion rubles or dollars, because the ratio between them is 1:1 in military production.

Now the task for the defense complex, which specifically turned out to be the most defenseless, is not conversion, but survival. And while I expressed the opinion a month ago that the defense complex was headed for collapse, now I say confidently: "They already have pulled it down." And deliberately, it seems to me.

What I saw in St. Petersburg in late January produced a depressing impression. It is probably even more terrible in the Urals, in the Tula region, in the Moscow zone, and in the East. There are no orders. People do not know what to do. They rush about. Hence also the very major breaches. They feverishly conclude any contracts with foreign firms, selling themselves, know-how, secret information, and technologies, just to obtain what is needed. A large number of light-fingered hucksters have made a rush for the defense enterprises, because the defense complex is the only thing we have.

[VOYENNNY VESTNIK] Yes, there is enormous potential there.

[Bazhanov] And that is why they thrust themselves on you. People have said to me more than once: "Why do you ignore commercial structures?" Naive person that I am, I took and sent general directors of the largest enterprises to these structures, where the people said: "Uh, no. You know, the dividends from your developments will come in about five years, but if you were to give us some kind of article in order to obtain income immediately..." Our businessmen shed tears on every corner that they are not being allowed into the defense complex. They assert that they would be delighted to invest money to support high technology... Nothing of the sort. Only where the fat is guaranteed. There is, was, and will be no altruism whatsoever on the part of businessmen.

And now the situation is as follows. We have no orders. They completely wrecked material and technical supply. The result is deplorable. Corporations, concerns and associations suddenly are declared to be state entities, although they were formed by a voluntary joining of enterprises. This is in violation of the law, and they did so with one purpose—to preserve the previous administrative-command structure. By the way, this did in fact happen. At the head of corporations are ministers, at the head of concerns are their deputies, at the head of

associations are chiefs of main directorates. You probably noticed when we were going down the corridor that the very same people are sitting there, only they call themselves something else.

All attempts to monitor fulfillment of antimonopoly legislation are failing. The Committee for Antimonopoly Legislation and Support of New Structures cannot physically cope with the orgy of prices and all the rest. The profitability of many raw materials suppliers is reaching 1000 percent and more. As a result it is becoming bad because of the price on the end product.

[VOYENNNY VESTNIK] Mikhail Nikolayevich! In connection with what you said, here is a question for confirmation: Has the state conversion program failed?

[Bazhanov] It never even began.

[VOYENNNY VESTNIK] Your Committee essentially is performing the functions of savior of defense sectors of industry?

[Bazhanov] That cannot be said, although we are trying to do this.

[VOYENNNY VESTNIK] Do you at least have prohibition powers to stop the collapse?

[Bazhanov] No. Our task is to coordinate efforts of all ministries and departments in the conversion area.

[VOYENNNY VESTNIK] The overall direction of conversion was determined with the help of your Committee and the government?

[Bazhanov] Quite right.

[VOYENNNY VESTNIK] And you will encourage its development?

[Bazhanov] Help, encourage, and direct.

[VOYENNNY VESTNIK] That is to say, essentially you are now running after the train. Will you succeed in overtaking it?..

[Bazhanov] I think we already have jumped up on the footboard.

[VOYENNNY VESTNIK] Mikhail Nikolayevich, in connection with your remark that 150 billion rubles—genuine ones, comparable with the dollar—are needed for conversion...

[Bazhanov] Nothing of the sort. I requested at least 1.5 billion rubles to support RDT&E if only a little... But the question still is being decided.

[VOYENNNY VESTNIK] The state obviously will not be able to allocate the money and commercial structures are uninterested in lengthy investments, especially in RDT&E. Then shouldn't enterprises be allowed to enter the international arms market?

[Bazhanov] I have no doubt whatsoever that all enterprises should have the right to work directly with foreign firms, and they themselves support me in this, especially as there are many enterprises which on the whole did not join the concerns and associations that were formed artificially. For just what is voluntary entry? The former minister announces an assembly of all enterprise directors. First question: Who agrees to join the concern voluntarily? If not, they deprive you of all the good things, which at that time the ministry still could provide. The Telekom concern is an example of this. I have much respect for then Minister of Communications L. K. Pervyshin, but that is just how it was. And later the Armed Forces chief signal officer, in those years General K. I. Kobets, drove up. "I have five billion rubles," he said, "Whoever joins the concern will receive it..." He turned and drove away. Fortunately the concern was under good leadership...

[VOYENNNY VESTNIK] Communications is a sector which easily lends itself to conversion.

[Bazhanov] Even then everything is complicated. And those sectors where there is a single-product system?

[VOYENNNY VESTNIK] Mikhail Nikolayevich! Let's return to the sale of weapons, if you do not object.

[Bazhanov] We do not come out as prohibitors. One of the Ministry of Economy departments assumed licensing functions, although it does not have a staff capable of evaluating technologies. There are only economists there...

Long ago I proposed to implement a simple scheme: to set up a directorate in the Ministry of Foreign Economic Relations for control of economic aspects, to set up a political directorate in the Ministry of Foreign Affairs, and to set up technical control with me. That's it. After this the commission takes a look and briefs the President, who is the one who should make a decision on arms sales. While the Ministry of Industry is deciding what it will trade, the enterprises are demanding licenses for themselves and hundreds of funds are requesting to be allowed to sell weapons.

The international arms dealers became agitated. They sent official letters where they categorically objected to the "proliferation" of companies for selling weapons. The weapons market never will be empty, and our statements on refusing to trade in weapons were greeted with delight because we are freeing up a market. An embargo on delivering weapons somewhere is another matter.

[VOYENNNY VESTNIK] But this already has to be a political decision.

[Bazhanov] Quite right. Now, not everything is simple with respect to domestic consequences of the arms trade. For example, we have one other structure, State Adviser on Conversion M. D. Maley; we have not seen each other for several months now, although we should be working

together. It seems to me he intends to turn all of Udmurtiya into an enormous military complex, inasmuch as they work on rather labor-intensive high-technology products there. Well, Mikhail Dmitriyevich suggested that they take up arms production, trade weapons on the international market and obtain dollars in order to live handsomely. Well, that's really nonsense! For not one state has yet been able to exist on just a single crop, even on coffee and bananas. That is why they are called banana republics. And here we have a missile republic. Nevertheless, the Udmurtiya Soviet of People's Deputies approved that proposal.

[VOYENNNY VESTNIK] But they will need steel, pig iron and, finally, food. Who will give them all this if they will not be producing anything for the domestic market?

[Bazhanov] That is what I am talking about. As soon as the suppliers of completing articles and raw materials hear that the end product is being sold for dollars, they too will demand payment in hard currency. And no amount of dollars suffices for everything. God willing, just to buy completing articles.

[VOYENNNY VESTNIK] And then this contradicts the idea of conversion. You have to restructure production, not chase the rabbit farther away.

[Bazhanov] You are right. Single-product production of weapons in Udmurtiya will lead to the collapse of its ruble ties with other republics.

[VOYENNNY VESTNIK] Tell me, Mikhail Nikolayevich, is it planned to establish working places for military and civilian specialists who are being released in the military-industrial complex?

[Bazhanov] Yes, retraining is under way. We are studying everything very fundamentally and we have complete information, but everything costs very dearly. *The government is not providing money for this (Editors' emphasis).*

[VOYENNNY VESTNIK] That is to say, you are simply working out plans for retraining, and there still is no final decision on the matter. Is that it?

[Bazhanov] Göbbels is known to have grabbed for his pistol at the word "communist." I want to do the very same thing when people say "plans," "plans for measures," and "commissions" to me, for if you intend to disrupt matters, just set up a commission or write a plan. We produce heaps of measures, but where is the execution? I believe what is needed is not to write plans, but to work specifically.

[VOYENNNY VESTNIK] Mikhail Nikolayevich, in connection with the fact that the President of Russia promised officers several thousand dollars each through the sale of weapons, let's "finish off" the financial question completely...

[Bazhanov] If an enterprise is sustained on a single-product system, if this is an industry without special

know-how and it is not a question of weapons of mass destruction, but about conventional weapons suitable for export, then sell them! They are even asking us for T-64 tanks! The fact is, this is a living source of currency. Look, here is an interesting thing. The Ministry of the Aviation Industry was assigned the task of developing installations for producing macaroni packaging. Before this the light industry institutes had struggled with the problem for ten years. But, I ask, why not buy it abroad? No currency. Fine, here is a gas turbine created by the Ministry of the Aviation Industry, an old aircraft engine is used. It produces 50 megawatts of power wherever you like: in the desert, in the taiga. How much does one gas turbine cost? Four or five million dollars. And each automatic packaging machine? Fifty thousand dollars. So sell one and fill up the country with automatic machines... Now there will be no cardboard... How much does an installation for manufacturing it cost? Two million dollars. Why not sell a couple of tanks and buy it? One simply has to think! And be a businessman.

It was not easy for me to make the transition to this area because I have been a military man all my life and suddenly had to engage in commerce. After serving in the Army and leaving the General Staff, I immediately formed a concern, an absolutely independent commercial structure which is operating successfully even now, and I very much regret that I had to leave the post of president.

[VOYENNNY VESTNIK] Mikhail Nikolayevich, do many enterprises of the defense complex have conversion plans?

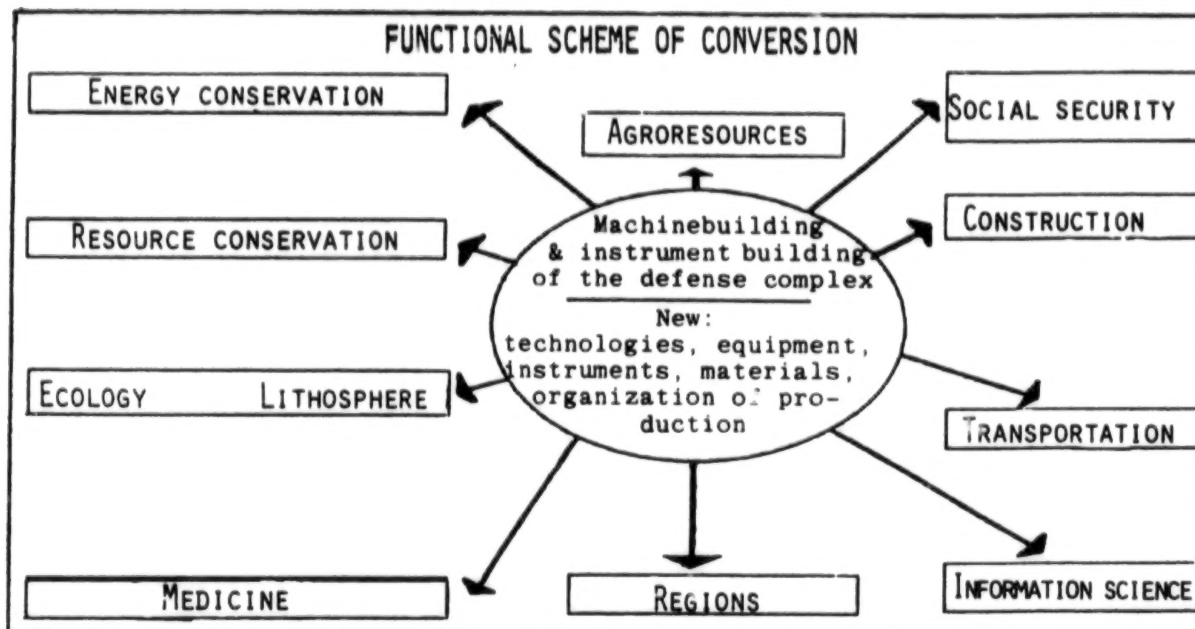
[Bazhanov] Approximately a third, and for half of those the quality is beneath any criticism, but even this is progress. The Ministry of the Atomic Energy Industry prepared well for conversion. It got into it necessarily and was the very first.

[VOYENNNY VESTNIK] Well yes, after Chernobyl...

[Bazhanov] I have here a folder with the ministry conversion plan published at the printing house. I hope to God they fulfill it. I will support them to my utmost. Good lads. They shifted to producing plants for processing milk, meat and so on. It is true, as A. V. Rutskey said, all their plants resemble nuclear reactors, but no matter what they look like, the important thing is to make sausage... We have good coordination with the Ministry of Agriculture. In general one observes a long-awaited unification of the heads of agriculture and of defense complex enterprises. The vice president must be given his due. Aleksandr Vladimirovich worked very actively on agricultural resources, and now a group of "turnkey" farms is being built in Podmoskovye at an initial cost of R600,000, and an agrarian reform center is being established.

[VOYENNNY VESTNIK] But inflation is growing...

[Bazhanov] Never mind, they can be repaid. There will be everything there, including even a little Robur truck.



Storage areas, water, sewer. There will be a common farm products processing complex for a group of farms costing six to eight million rubles. It is capable of supplying a city of 200,000 persons. Imagine, one complex and an entire city!

And so we propose that you please find your niche in the conversion scheme and we will help. We will contact whomever necessary and even select foreign partners. Things already are under way where people are clever. Conversion is beginning... In general I must say that if the cumulative volume of products put out by the defense complex is taken as 100 percent, then 60 percent or more will fall to civilian products. With respect to science-intensive, high-technology kinds of articles (television sets, tape recorders), I will note in conclusion that their output is fully supported by the defense complex. This already has become a kind of tradition, because there is no one else.

When the Issue Was Being Made Up: A Turning Back?

[VOYENNNY VESTNIK] Much of what was talked about in the interview changed while this issue was being prepared for press and naturally a new meeting with Mikhail Nikolayevich was required. It took place in late May. Here is what we heard from him.

[Bazhanov] It is common knowledge that B. N. Yeltsin signed documents on 30 January connected with setting up the State Committee on Conversion. It was eliminated also by presidential edict less than a month later, on 24 February. To this day it is not understood why and for what this was done. Evidently this was purely a political act carried out by the Russian Federation Ministry of Industry, which saw our Committee as a dangerous rival, for in the few months of its very brief existence it fulfilled an incomparably greater

volume of work. And what is most interesting, there still is no structure of any kind continuing the job of conversion in the Ministry, but by edict it is the successor of the Committee!

What has been said of course cannot help but be distressing inasmuch as the situation in the defense complex continues to leave much to be desired. True, after our persistent suggestions to the Ministry of Defense, funds were allocated for purchasing arms and military equipment produced in the fourth quarter 1991 and first quarter 1992. As the President said, this was in order to sell it abroad and support both state and industry with the money earned.

Fifteen billion rubles also went into the conversion fund. In the opinion of Minister of Finance V. V. Barchuk, however, there are for now no worthy projects in which the money could be invested. He declared this at a government session which took place immediately after the Congress, and I passed a note on the spot to Ye. T. Gaydar to the effect that we have at the very least 40 specific projects which could provide colossal profits if implemented. No reaction has followed for now.

When we analyzed the state of affairs together with presidents of the largest concerns and corporations of defense sectors, an appeal was prepared to Russian President Yeltsin. He received the heads of structures working for defense on 13 May. The meeting contributed to better mutual understanding and proved very useful. A presidential edict was prepared on establishing the Perun (ancient Russian name for the god of fire) and Radetel (acronym from radio engineering, electronics and telecommunications) state commercial companies. One other company for manufacturing special articles in defense sectors stands by itself. The important thing remained—implement the decisions. This is not easy. It

will be necessary to overcome fierce opposition, for without any doubt, creation of such companies will lead to elimination of absolutely unnecessary departments and structures and a mass of bureaucrats will be without jobs...

COPYRIGHT: "Voyennyy vestnik", 1992

**Glukhikh of Defense Industries' Committee
Interviewed**

93UM0307A Moscow KOMSOMOLSKAYA PRAVDA
in Russian 3 Dec 92 pp 2-3

[Interview with Viktor Konstantinovich Glukhikh, First Deputy Minister of Industry of Russia and chairman of the RF Committee for the Defense Sectors of Industry, by I. Chernyak: "The VPK [Military-Industrial Complex]: Our Tanks—Your Steel"]

[Text] *Viktor Konstantinovich Glukhikh. Age 46. Russian. Worked as deputy chief industrial engineer, chief engineer and deputy general director of a PO [production association] with the outwardly inoffensive name of the Leningrad Metals Plant. Has been First Deputy Minister of Industry of Russia and chairman of the RF Committee for the Defense Sectors of Industry since November 1992. This is his first interview in the new position.*

[I. Chernyak] Viktor Konstantinovich, almost a year has passed since the collapse of the USSR. As the result of that collapse Russia has been deprived of a quarter of the defense plants and almost half of the repair plants, quite a few fighter and transport aircraft, tanks and self-propelled vehicles, ordnance etc. that were left on the territory of the other republics of the CIS. The level of equipping of the Russian army and navy with modern types of armaments, according to Ministry of Defense data, is just 30 percent today. Information has also appeared in the press that not a single ship has been laid down and the turnover of the planned submarines, including the ultra-modern ones at the Sevmashpredpriyatiye PO, has been jeopardized due to the sharp cutbacks in state orders and the trimming of the military budget in Russia. Such new types of armaments as the MiG-29 and MiG-31 aircraft and the T-72 BM and T-80 tank, among others, have been projected for removal from production. There is no money to launch the series production of the latest Su-35 fighters or the Yak-141 vertical-takeoff aircraft for the Navy, and the production of the Su-27 is being curtailed; this list could be continued. What are your comments on the prevailing situation?

[V.K. Glukhikh] The question has been posed in too categorical a fashion, in my opinion. Yes, spending on defense, including arms procurements, is being cut back. The profound conversion of defense industry has begun, and it has affected virtually all plants in the defense complex. No country in the world has pursued conversion on the scale of 68 percent a year—that is nonsense. (By way of comparison, annual conversion in the United States is 3—5 percent, and if it is more

than seven, then the state is required by law to pay an enterprise for profit shortfalls.) Our industry was not ready for an "avalanche" of conversion. Whence the host of unsolved problems. We have had to forego the production of a number of weapons, but there cannot be and is not any great calamity in that. Something else is troubling me today—how can we preserve the output of the remaining ones? It is simply essential to take into account the minimally allowable level of production when determining the amounts of financing for procurements. If I as the director of a plant get an order for one aircraft when I have the capacity for a hundred, no army will buy it at the price for a hundred. And I am supposed to preserve all of the machine tools, welding and assembly jobs and all the passageways therein. Either the plane will be wildly expensive, or I will refuse it as unprofitable as a result.

In any case, your questions can be answered only by having an idea of military doctrine and the conceptual framework for structuring the armed forces of Russia.

[I. Chernyak] But after all, Viktor Konstantinovich, you know as well as I do that several years ago the USSR and the United States, according to the data of the Stockholm Institute for the Study of Problems of Peace, shared first place in the export of military hardware. Both received roughly 60 billion dollars for it over 1986-91. That was one of the principal sources of hard currency for us. The information for 1991 was published recently; the United States sold 14.2 billion, and we sold five. The situation will obviously be even worse this year. It would seem that somebody is pursuing a policy advantageous to the United States to the detriment of Russia—after all, as a result of it Russia loses tens of billions of dollars, America gains and then we ask them for credit. Who is to blame—the president, the Supreme Soviet, the government, the MVES [Ministry of Foreign Economic Ties], the CIA or some other dark forces?

[V.K. Glukhikh] I would not be looking for the intrigues of dark forces here. There is a series of objective reasons for the cutbacks in our military deliveries. They are the end of the Cold War, the curtailment of global confrontation as the result of the new foreign-policy course of Russia and the collapse of the Warsaw Pact and CEMA.

The USSR moreover had a multitude of political-commercial contracts, under which military hardware was sold to a number of countries cheaply or under long-term contracts at minimal interest rates, that brought us no profits. Are we really incorrect to repudiate those?

I would also not forget the grave economic situation of our traditional importers among the Third World countries and the institution of the international embargo on weapons deliveries to Iraq, Libya, Kuwait, Jordan and some other regions. Competition has also gotten stronger in the world arms market—our former Warsaw Pact counterparts are rushing weapons that have been freed

up to them, while the positions of such countries as Brazil, Israel, South Africa and India have also gotten stronger...

We have not surrendered our positions in quality—we surpass the United States in a number of areas as before, in some places we are at the same level and in some we trail. But while we were debating what to sell and what not, with whom to trade and with whom not, a host of markets were lost. The fact that many of our politicians and parties are even satisfied—a democratic country, they say, should not be trading in arms—is striking. But look at the United States: a super-democratic state, in their opinion, how much do they sell? And, supporting such politicians with delight, they are occupying the very markets where we used to be.

We will begin augmenting our exports in the near future, or at least I will apply maximum effort to it. At least so as to see that our enterprises have the opportunity to carry out conversion at the expense of the funds obtained.

[I. Chernyak] But an alarming situation is already taking shape at defense enterprises today. Dozens of plants have been shut down, more than a hundred are on the verge of shutting down and hundreds have three- or four-day work weeks. Unemployment threatens whole regions. If you take into account the fact that a number of enterprises in the VPK are out "in the sticks," including in the closed cities where job placement is doubly difficult, then it may be assumed that up to a million people could be on the street as early as tomorrow. The whole city infrastructure in some regions, after all, was maintained through the defense plants, and is now in a state of decline. Viktor Konstantinovich, do you not fear an explosion? What will you do to keep that million from dying of starvation?

[V.K. Glukhikh] As for a social explosion, such apprehensions do exist. Aside from the sharp decline in defense orders for this year, the situation is being aggravated by a number of other, interconnected factors. The liberalization of prices in the raw-materials sectors of industry, for power carriers, transport etc. has caused substantial cost increases in military products. The customers simply have no money. Interruptions in the payment of wages have now started owing to the failure of funds to come in for products already shipped, and the enterprises have no working capital for pre-payments or the procurement of supplies and materials. And a number of our enterprises, after all, are enterprise-cities. Take that same Sevmashpredpriyatiye PO in Severodvinsk, where the submarines are produced. There is a city of 300,000 on the shoulders of that PO. If the people have no work, they are doomed to desolation.

[I. Chernyak] I can imagine your reaction after the announcement by Yeltsin in Seoul of the curtailment of Russian submarine production...

[V.K. Glukhikh] I was not especially bothered by that, because I knew that the discussion concerned a shipyard

in the Far East. Boris Nikolayevich had already signed a decree that military production be eliminated there and transferred to Severodvinsk. The president simply did not express himself quite clearly.

But we are making every effort to see that the Sevmashpredpriyatiye is utilized by more than defense orders alone, and we are seeking other work. They include, for example, the production of platforms for the drilling and production of oil and gas under northern conditions. We are creating the Rosshelf joint-stock company, which will produce gas at the Shtokmanovskoye field. We have set the goal that 80 percent of the equipment there be supplied by our plants, rather than purchased from the Norwegians, Finns or Americans. It is a very serious matter, I think, and such well-known plants as the Kirov Plant and the Rubin KB [Design Bureau] will be engaged as well. That is real conversion, and not the production of aluminum bowls.

I will say bluntly that we will be conducting ourselves inside the country quite aggressively now. My task today is to ensure growth in jobs here, not in the West. And I will be lobbying our own industry rather than Western industry; its viability and market competitiveness are of interest to me first and foremost. Although it is exceedingly difficult to increase its market competitiveness over such a short time interval. As for the break-up of business ties... Production was unfortunately monopolized in all sectors in the Union, and many enterprises put out only one product line or constituent item, and we were thus largely tied to Ukraine, Belarus, Kazakhstan etc. Not everything needs to be moved to Russia, and that is not expedient even in a purely economic sense—billions have been invested in capacity, and now what, invest again? It is easier to buy those products. I think we will get used to the political issues. Many of our politicians evidently still do not understand that it is very difficult to get access to someone else's market. Meanwhile we have our own enormous market, and we have to make use of the advantages of it. And protect it somewhat against the invasions of Western investors, at least in the areas that are well-developed here. All countries that are coming out of a crisis, after all, offer the carrot to their own producers rather than foreign ones.

Furthermore, today, whatever some may want, neither cooperatives nor anyone else will supplement the state budget. The money goes to the enterprises. If you take the associations and enterprises that used to be under Minprom [Ministry of Industry], for example, the budget was 56 percent composed of their contributions. It is already time to understand that the VPK is not the country's misfortune, but rather its property that must be used intelligently. And the transition from militarized production to civilian should be smooth. In some areas we have slipped from a hundred percent to zero over a year. Everything has gone more or less smoothly in places where there has been a preparatory period, and in critical fashion where there has not been one. Take the ammunition sector. These are, as a rule, facilities that are far from civilization. There is nothing there besides the

production. Time and money are needed for retrofiting. We cannot halt production all at once and throw 200,000 people into the street, and if you count the families at a factor of three, you get some awful numbers.

The year 1992 was personally the most difficult year of my life. It is terrible when plants are stopping right in front of your eyes and you can do nothing about it.

[I. Chernyak] Do you think that 1993 will be better?

[V.K. Glukhikh] I am a realist. Next year will also be very difficult. But I hope that at least some stabilization will begin. I am struck by the director corps: how can they withstand what is being created? All of the unfinished business of the government and the Supreme Soviet has landed on the shoulders of the directors, and they are balancing themselves like acrobats today trying to smooth out those errors, rushing about to and fro.

I would say for the sake of fairness that steps have been taken for mutual offset, the granting of favorable credit and subsidies with the coming to the Russian government of Vice Premier G. Khizha and to the Central Bank of V. Gerashchenko, facilitating somewhat of a revival of the situation at the defense enterprises. But the situation has not yet been able to be fully rectified.

[I. Chernyak] But the crisis has touched on more than the plants, after all. Take science. It has always been the first place where economizing occurs. Appropriations for military research have been cut back by almost half over the last three years. The development of such areas as air defense, space reconnaissance and the production of new types of aircraft has been halted. NIIs [scientific-research institutes], KBs and labor collectives are being destroyed and skilled personnel are leaving, including abroad. The prospects, in my opinion, are not happy ones. Russia also trails the West by decades here as well. So it turns out that we are programming that lag now? Is this being done intentionally, in your opinion, or is it the result of an objective process?

[V.K. Glukhikh] One cannot agree with the fact that economies are always in science. If that were the case, we would not have achievements that are known around the world in both the military and the civilian spheres. But appropriations for military research and development have been cut back substantially in the last two or three years (by 33 percent compared to 1991, according to our estimates, and by 50 percent compared to 1989).

These reasons, as well as the lower wages over the last year and a half or two years compared with other sectors of industry and the loss of prestige of the work, have led to an appreciable outflow of scientific cadres from the defense sectors (170,000 people over the first half of this year alone).

All of this occurred, in my opinion, due to a failure to understand the role and significance of the research and development being pursued by the defense sectors of industry in the development of Russia. We love to point

at the West. So look, then: billions go for military science in France. Take research on missile topics—40 percent of the spending on scientific research and experimental design goes for that, while here they are trying to prove that missile technology is not needed.

Maintaining science is one of our main tasks. Many enterprises will survive despite everything, but science cannot; it has no fixed capital, no working capital. It cannot provide an immediate return and bring profits!

We are trying as best we can to rectify the situation. Decisions have been prepared on subsidies and favorable credit for scientific enterprises this year. We are granting the status of state scientific centers to a number of scientific centers in the aviation and space sectors, such as TsAGI [Central Institute of Aerohydrodynamics imeni N.Ye. Zhukovskiy] or GOI [State Institute of Optics imeni S.I. Vavilov] in Saint Petersburg, where all research on optics is concentrated, and some major institutes in chemistry and munitions. There will have to be losses, but they must be saved, because their viability will provide the scientific work for the future, not for us but for our children and the coming generations.

[I. Chernyak] There was a time when the word "conversion" could be found in any newspaper. Now the hue and cry seems to have abated somewhat. The shelves have not filled with vacuum cleaners, televisions, video recorders and washing machines. It is not surprising, since according to the data of Western experts, 7-8 years and 150 billion dollars are actually required to accomplish conversion. We have neither dollars nor time. You yourself believe in the success of this process, but when can the population expect tangible results?

[V.K. Glukhikh] I will start with the fact that the approach to conversion by the union government—an attempt to treat all alike—was doomed from the start. I have already said that I do not understand conversion as the production of frying pans instead of tanks. The main thing is to increase the provision of items intended for the agro-industrial complex, medicine, communications etc. to the population. And, of course, the more widespread use of "dual-application" technologies. Enormous amounts of funds, after all, have been pumped into the VPK here, the best minds were directed there—which, by the way, they still have today. The aim of conversion is not restricted to increasing consumer goods, although that is the most tangible achievement of it. The easiest thing, however, is to supply the new equipment and start putting out video recorders instead of missile tracking systems. I am, of course, not against video recorders, and the enterprises of the VPK, by the way, are the only ones in the country putting them out. As well as the principal portion of televisions, washing machines and refrigerators.

[I. Chernyak] But after all, your products clearly cannot stand up to competition...

[V.K. Glukhikh] Why? Yuyuzan and ZIL sell those refrigerators and a number of other goods abroad, but everyone

does not know that. But the problem is something else. A few years ago the VPK was directed toward the output of products for the light, textile and food industries and the agro-industrial complex. Today more than three thousand new types of machinery and devices have been created here in missile areas alone that remain unclaimed. The industrial enterprises and farms have no money.

Yes, there was a drop of 20 percent in the output of civilian goods in 1992, owing to the fact that the plants producing the materials and constituent items ended up outside the country—in the Baltics and Georgia. Today we are being forced to set up a number of product lines in Russia. We will increase the production of consumer goods by 5—10 percent in 1993, as well as their variety. But considerable state appropriations and time are needed for better results. We also need a series of political and economic decisions.

Do we believe in success? I will answer this way: there is nothing else for us.

[I. Chernyak] And a last question. Viktor Ivanovich, what are you expecting from the congress?

[V.K. Glukhikh] I am not expecting any great upheavals. But I am anxious that a clear-cut line be worked out—just what it is we want. Stability in decision-making is important. When the governments and the people you are working with change every six months, it is difficult for the enterprises as well as yourself. Look at what happens—over a year the terms of the “game” change several times: taxes jump to 80 percent, then drop, concessions are introduced and then taken away—no one can make it. The vested interests of the country today must be clearly determined. Machine-tool building production? Then release the machine-tool builders from a series of taxes, grant them concessions. A system of concessions, after all, sometimes provides more than threats of punishment.

So then, I think that the congress will not be a simple one. But there should not, according to my forecasts, be any significant deviations in this or that direction. I repeat once more than stabilization is needed—both political and legislative.

Regulation on Military-Technical Cooperation of the Russian Federation With Foreign Countries

93UM0325A Moscow FOREIGN TRADE in English
No 6, 92 pp 43-44

[Text] This Regulation shall specify the procedure of the state regulation of the export and import of armaments and military equipment, work and services in the sphere of military-technical cooperation of the Russian Federation with foreign countries (hereinafter referred to as military-technical cooperation).

The decisions on questions concerning military-technical cooperation, depending on their importance, shall be taken by the relevant state bodies of the Russian Federation.

1. The President of the Russian Federation, upon recommendation of the Government of the Russian Federation, shall take decisions on:

- conceptual approaches to military-technical cooperation;
- establishment of military-technical cooperation with the states with which it had not cooperated before;
- deliveries of armaments and military equipment not previously supplied abroad and the transfer of licenses on their manufacture to foreign countries;
- cooperation in designing armaments and military equipment with foreign states;
- suspension, stoppage and resumption of military-technical cooperation with separate foreign states.

2. The Government of the Russian Federation, upon recommendation of the Interdepartmental Commission for Military-Technical Cooperation of the Russian Federation with Foreign Countries, shall take decision on:

- establishment of bilateral and multilateral Interstate Commissions for Military-Technical Cooperation by agreement with interested states;
- the export and import licensing procedure of armaments and military equipment;
- establishment of general export quotas for armaments and military equipment;
- the schedules and terms of deliveries of armament and military equipment abroad, the transfer of licenses on their manufacture to foreign states and on rendering technical assistance in constructing (supplementary equipping) special projects at foreign states' requests;
- leasing of armaments and military equipment to foreign states in the armed forces' interests;
- the list of armaments and military equipment permitted for export;
- the list of states to which the delivery of armament and military equipment is prohibited;
- settlement of debts resulting from fulfillment of the Interstate agreements on the delivery of armaments and military equipment and other types of military-technical cooperation;
- permission of prohibition of the export and import of armaments and military equipment, work and services of a military-technical nature to foreign economic associations and enterprises designing and manufacturing these products, as well as associations, corporations, concerns, joint-stock companies and other organizations of the Russian Federation.

3. The Interdepartmental Commission for Military-Technical Cooperation of the Russian Federation with Foreign Countries (hereinafter referred to as KVTS) shall:

coordinate and control the activities of ministries, departments, enterprises and organizations participating in military-technical cooperation;

organize the activity on setting up bilateral and multilateral interstate commissions on military-technical cooperation;

take decisions on foreign states' deliveries of armament and military equipment to third countries manufactured to Russian licenses;

approve methodological documents on arrangement of military-technical cooperation;

consider current matters concerning military-technical cooperation.

4. The Ministry of Foreign Affairs of the Russian Federation shall:

control the fulfilment of the Russian Federation's international commitments and participate in elaborating documents on reporting through the UN and other international organizations concerning military-technical cooperation;

participate in elaborating conceptual approaches to military-technical cooperation and proposals in this sphere as well as in the interstate commissions for military-technical cooperation;

control the protection of the Russian Federation's political interests by the participants of military-technical cooperation.

5. The Ministry of Economy of the Russian Federation shall:

elaborate proposals on the export and import range and volumes of armament and military equipment for the current and long-term period jointly with the Ministry of Industry of the Russian Federation and the General Headquarters of the CIS Armed Forces;

set up, upon the instruction of the Government of the Russian Federation, commissions (on a bi- or multilateral basis) for military-technical cooperation jointly with the Ministry of Industry of the Russian Federation and other interested ministries and departments.

6. The Ministry of Industry of the Russian Federation shall:

consider requests of enterprises and organizations designing and manufacturing armament and military equipment to grant them the right to participate in military-technical cooperation and submit corresponding recommendations to KVTS;

coordinate and control the activities of subordinate enterprises participating in military-technical cooperation.

7. The Ministry for Foreign Economic Relations of the Russian Federation shall:

submit proposals on military-technical cooperation to KVTS; organize realization of mutual commitments stemming from interstate agreements concerning military-technical cooperation and activities on repayment and settlement of foreign countries' debts;

control prices on the main export types of armaments and military equipment, ensure methodological, informative and consultancy servicing of Russian participants in military-technical cooperation on price, currency-financial, crediting and legal matters;

formulate and issue, within the established quotas, in the established manner, licenses to the participants in foreign economic activities who have been granted the Russian Federation Government's permits to export (import) armament and military equipment as well as control the receipt of currency from export operations;

elaborate draft interstate agreements on military-technical cooperation at foreign states' requests and conduct, upon instructions of the Government of the Russian Federation, negotiations and sign these agreements;

control fulfilment of Russia's commitments under interstate agreements on military-technical cooperation by Russian participants in military-technical cooperation.

8. The Ministry of Defence of the Russian Federation (the General Headquarters) shall:

participate in elaborating conceptual approaches to military-technical cooperation and in determining its directions, forms and volumes;

undertake practical activities connected with rendering assistance in operating and military using of the supplied armament and military equipment to foreign countries;

supply special facilities released from the Armed Forces to foreign countries in accordance with the decisions of the Government of the Russian Federation, repair foreign countries' armaments and military equipment in its enterprises, lease transportation facilities to foreign partners, send military experts to foreign countries, train national military specialists and technical personnel, conduct military field exercises and firing practice of foreign countries' army detachments.

9. The External Intelligence Service of the Russian Federation shall:

promote military-technical cooperation by performing a political, international, legal and economic analysis of the aspects of this cooperation and specific draft agreements on export-import operations;

participate in gathering and using information on military-technical cooperation, help check foreign partners' reliability.

10. Enterprises, associations and organizations designing and manufacturing armament and military equipment shall, in accordance with this Regulation, participate in military-technical cooperation within their powers and according to the decisions of the Government of the Russian Federation which are the foundation for the Ministry for Foreign Economic Relations of the Russian Federation to issue corresponding licenses on their export-import operations.

Enterprises' and organizations' requests on participation in military-technical cooperation shall be considered by relevant ministries and departments within three weeks.

11. The ministries' and departments' proposals on military-technical cooperation submitted to the Government of the Russian Federation must be coordinated with the General Headquarters of the CIS United Armed Forces, the Ministry of Affairs of the Russian Federation and the Ministry for Foreign Economic Relations of the Russian Federation and also (proceeding from the content of these proposals) with other interested ministries and departments of the Russian Federation at the level of at least Deputy Heads dealing with military-technical cooperation.

12. Activities in the sphere of military-technical cooperation shall be kept to the required security level.

Approved by the Decree of the President of the Russian Federation of May 12, 1992; No. 507

Foreign Economic Activities of Enterprises Under Conversion

93UM0326B Moscow FOREIGN TRADE in English
No 6, 92 pp 46-47

["Foreign Economic Activities of Enterprises Under Conversion (An extract from the law of the Russian Federation On the Conversion of the Defence Industry, No. 2551-1 of March 20, 1992.)"]

[Text]

Article 9. Types of Foreign Economic Activities

1. Converted enterprises have the right to independently engage in foreign economic activities in accordance with the legislation of the Russian Federation.

In doing so enterprises have the right to:

—export of raw materials, other material, equipment released in the course of conversion if it is impossible to use them for the manufacture of civilian products, taking into account the requirements contained in Article 10 of the present law;

—import of technical equipment and machinery and technologies, as well as completing articles for the manufacture of civilian products;

—transfer (exchange and sale) in the established order of technologies, licenses, know-how, scientific and technical information which before the conversion were used in the production of armaments and military hardware;

—participation in conferences, symposia, exhibitions and fairs with the demonstration of new materials, equipment, instruments and advertisement descriptions of technologies which were previously used for the production of armaments and military hardware;

—designing, production and sale of armaments and military hardware by licenses in the order established by the legislation of the Russian Federation;

—participation, in cooperation with foreign firms, in the designing, production and sale of military-purpose products in accordance with the legislative acts of the Russian Federation providing for the protection of the military and technological interests of the Russian Federation.

2. The activities of enterprises with foreign investments are regulated by the RSFSR law **On Foreign Investments in the RSFSR** and other legislative acts of the Russian Federation.

Article 10. Protection of the Military-Economic and Scientific-Technological Potential of the Russian Federation

1. In order to avoid damage to the military-economic and scientific-technological potential of the Russian Federation in carrying out foreign economic activities by converted enterprises, as well as to ensure the non-proliferation of mass destruction weapons the said enterprises must strictly abide by the restrictions imposed on the export (transfer, sale) of civilian-purpose products and technologies but which can be used for the creation of mass destruction weapons. Restriction on the export (transfer, sale) of the said types of products and technologies are established by the Supreme Soviet of the Russian Federation and the Government of the Russian Federation.

2. In their foreign economic activities converted enterprises are guided by the following provisions:

—export of strategic raw and other materials and equipment is carried out by licenses issued in each particular case in accordance with the legislation of the Russian Federation;

—transfer of technologies, licenses, know-how and scientific and technical information for the organization of the manufacture of civilian-purpose products and/or their use in commercial, scientific and technological ties with foreign firms are carried out on the condition of ensuring the protection of military-economic interests of the Russian Federation;

—sale of armaments and military hardware, special systems, complexes, functional blocks and assemblies which are part of armaments and military hardware, as well as technologies for their production, is carried out in the order established by the Government of the Russian Federation.

Note on Law on Conversion

93UM0326A Moscow FOREIGN TRADE in English
No 6, 92 p 46

["Law on the Conversion of the Defence Industry"]

[Text] Russia passed the law On the Conversion of the Defence Industry which, estimates say, accounts for about 60% of the industrial potential of the country. Hypertrophied defence expenditures do not allow to raise the standard of living of the population and divert resources, the best brains and skilled labour to wasteful purposes. The termination of the Cold War and Russia's incorporation into the world community allow to lift this back-breaking burden.

Conversion is understood as a partial or total reorientation of production capacities, scientific and technological potential and labour resources of defence and concomitant enterprises from military to civilian purposes. The law defines the main principle of the work of converted enterprises as the use of the high technologies of the defence sector for the production of goods which would be competitive by the world standards.

It should be noted that already today the defence sector produces not only armaments but also 92% of machinery and equipment for the light industry, 83% of medical equipment, 76% of equipment for processing agricultural produce. In the total volume of the industrial output of Russia defence enterprises account for the production of 100% of TV sets, sewing-machines, cameras, video tape-recorders, 98% of tape-recorders and refrigerators, 95% of computers, 88% of diesel engines and diesel generators, 72% of vacuum cleaners, 66% of washing machines, 33% of trunk-line cargo waggons, 28% of oil drilling equipment for oil and gas extraction.

Nevertheless, in connection with a sharp drop in the financing of military orders when the expenditures for the purchases of armaments have already decreased 6-fold, many enterprises are on the brink of bankruptcy. The state intends to render financial support in the transitional period by setting up an ad hoc conversion fund.

Foreign investors, too, are invited to participate in the privatization of enterprises slated for conversion. Enterprises themselves are granted extensive rights in the field of foreign economic relations under a special section of the law which is published in full below.

Military Import-Export Company 'Spetsvneshtekhnika'

93UM0232D Moscow TEKHNKA 1
VOORUZHENIYE in Russian No 9-10, Sep-Oct 92
(signed to press 26 Aug 92) p 42

[Letter by V. Brailovskiy, president of Spetsvneshtekhnika State Foreign Economic Company for Arms and Military Equipment Export and Import; color photograph of Brailovskiy included with letter]

[Text] Gentlemen!

Permit me to introduce Spetsvneshtekhnika to you.

Our organization has many years of work experience in the area of military-technical assistance to foreign countries and is one of the largest state foreign trade organizations in Russia.

The following are main directions of our work:

- export and import of arms, military equipment and parts therefor;
- export of products for technical-production purposes;
- RDT&E for foreign clients;
- transfer of licenses, know-how and other technical documentation;
- technical assistance in organizing production, servicing and repair of special property;
- constructing special installations;
- recycling special property.

We have work experience in the area of conversion of Russian defense industry enterprises and are ready, if you are interested, to provide assistance in investing in freed-up capacities of the defense complex for organizing production there of commodities for general civilian purposes. These enterprises have highly skilled personnel and large technical and scientific potential.

We have a ramified broker network and are the founders of several banks, insurance companies, concerns, firms and joint ventures both in Russia as well as abroad.

Our official representatives are accredited with Russian Federation Trade Representations in many countries of the world.

In coming to us, you will find a reliable partner in your activities both in the Russian market as well as other markets.

The sphere of our business activity is essentially unlimited.

If you are interested in additional information, you may contact us at any time convenient for you.

Company president

V. Brailovskiy

Russia, Moscow, Gogolevskiy bulvar, 21. Fax: 230-23-91 Telex: 411957 Telephone: 202-66-03

The specialized journal *TEKHNIKA I VOORUZHENIYE* will offer you additional information about Spetsvneshtekhnika work and about displays, exhibitions and presentations of Russian arms, and will offer advertisements of models of arms and their specifications and performance characteristics.

COPYRIGHT: "Tekhnika i vooruzheniye", 1992

Missile Troops Subsidiary Industry

93UM0327A Moscow MOSCOW NEWS in English
No 47, 22-29 Nov 92 p 9

[Article by Vladimir Dudnik and Anatoly Kravtsov, members of the Military for Democracy movement: "Missile Sites Unfriendly to Nature are a Source of Personal Income for the Military"]

[Text] Missile site forest cuttings are expanding far beyond the absolutely required limits and are in appalling conditions. Dumped diesel fuel has seeped 20 centimetres deep into the ground over the aggregate area of 80,000 square metres. About 16,000 tons of harmful substances have been dumped along the shores of rivers Yurya, Velikaya, and Zimnyaya, increasing the concentration of poisons in water to levels which are a dozen times over the tolerable limit. Only this year the responsible military authorities have been fined 25,000,000 roubles.

Such forest clearings in the Kirov Region are being made by the locally stationed division of the strategic missile force, with headquarters at the Yurya-2 settlement, and under command of General Vladimir Kalyanov. The division has at its disposal an area of 86,000 hectares under control of the Polar Circle Forest Military Administration responsible to the Volga Region Military District Quartermaster Department which is subordinate to the Central Military Construction Directorate, GVSUTs.

Profitable Business

The Nizhni Novgorod Timber Integrated Works No. 78 (of the GVSUTs) was, until 1990, the main consumer of timber felled there. This year, the Works became part of the Yuryales Co., Ltd.

By October 1992, Yuryales felled trees equivalent to 50,000 cubic metres of timber. It could fell more, since the Deputy USSR Defence Minister and Chief Quartermaster gave the Works No. 78 a licence for 100,000 cubic metres of timber back in 1991. Another 24 forest districts were open for felling.

The work was done with the use of capital goods (tractors, trucks, tree bulldozers, houses and other

structures and equipment) worth millions of roubles and belonging to enterprises which are collective members of the company. But the profits (in line with Article 10 of the Articles of Association) were shared in proportion to the members' shares in the authorized capital stock, which means that the mass of individuals contributing 1,000-3,000 roubles got 31.5 per cent of the profit which is 1.5 times greater than the share of profit the Works can claim.

Thus, this scheme is pumping money earned by state property into private funds, rather than the state budget. State employees are prohibited involvement in commercial projects. But what is prohibited to the generals is permitted to their wives. So you can find the chief of the Military Construction Directorate and the wife of the division's commander among the directors of the Yuryales company.

Where Are My Millions?

Perhaps it was this question that wives of ranking officers of the division, Leokadia Ksenzshik and Svetlana Gritsenko asked the selves. They invested 2,500 and 5,000 roubles to the authorized capital stock of another limited-liability company, called Yel. Wife of forester V. Dorofeyev, Vera invested 5,000 roubles.

The Yel directors provided for the possibility of export-import operations involving timber, in the Articles of Association. With that prospect in view, they invited Arkhangelsk resident Andrei Novosyolov (whose investment was 2,500 roubles). According to V. Dorofeyev, a contract for felling timber equivalent to 15,000 cubic metres of wood to be completed in 1992, was made with the missiles division. Over half of the timber will be left at the disposal of the company (which intends to sell it for hard currency). But no copy of that agreement could be found at the division's office.

Not only tax inspectors but also a commission of environmentally-minded people's deputies were forbidden to visit the territory of the division. Russia's Chief State Inspector Yuri Boldyrev and chairman of the Committee for Servicemen and Their Families sent a special commission to investigate the situation in the division. However the commission was not allowed to visit all the division's regiments. The division's commander also refused to receive a delegation of deputies of the Kirov Region Soviet.

After long and fruitless attempts to find a common language with the commander, representative of the Russian President in the Kirov Region, V.M. Sumarokov sought help from the Defence Ministry, the Procurator-General, and the Chief State Inspector of the Russian Federation. Eventually, his appeals found their way to the table of Col.-Gen. V. Mironov, Deputy Defence Minister, who issued an order: "Extend the contacts between local bodies of power and military

commanders. Specific orders on the matter have been issued to military units and institutions."

The "extension of contacts" was strange. Sergei Tsibin's (from the Kirov Region Soviet) attempt to meet with the commanding officers of the division was to no avail. He sent a written request of a meeting, but no answer came. Recently, an agreed meeting with Valery Puryga, member of local government, was aborted by a drill alert. The division commander has banned all trade but from the garrison stores, on the territory of the division.

From Defence to Offensive

In October, the mass media reported repressions of military servicemen who "showed political maturity and rose their voices for law and order and against concealing crime" (as they are commended in Vladimir Sumarokov's letter). The governmental commission investigating the situation in the division leaked some of its findings to the press. But what was the response?

On October 15, officers of one of the division's regiments (military unit 19970) circulated a letter among the mass media, in which they didn't challenge the truth of the reports but accused the commission of "driving a wedge of discord" between the people and the army and of slander against the strategic missile troops which "are on standby protecting the Russian reform," and alleging that the current moment was specially chosen for criticism against the unit, to inflict maximum harm.

Another regiment (military unit 14089) wrote to the President: "Numerous press articles undermine the country's ability to defend itself," wrote someone who claimed to be expressing the attitude of all officers.

Yet another letter (from military unit 68546) states that "all that introduces confusion among officers" and warns: "we know who profits from the situation."

Indeed, who? Who tries to conceal from the public the barbaric felling of trees and harming of nature? Who lines the generals' pockets with easy money earned in the process?

What is the opinion of the commanders of the strategic missile force and the military procurators? They must have all the documents pertaining to the matter now.

Vega-M' NPO's Effort to Deal with Conversion

93UM0305A Moscow PRAVDA in Russian 3 Dec 92 p 4

[Interview with G. A. Koshevarov, general director, NPO Vega-M: "The All-Seeing Eye: Vega-M Aloft and on Ground"; date and place not given; first paragraph is PRAVDA introduction]

[Text] Due to open in Moscow in the next few days is the International Congress on Military Conversion in Russia. This matter for our country is of immediate importance. According to Goskomstat [State Committee for Statistics], conversion is presently under way at more than 600

defense complex enterprises. What opportunities does this afford the national economy, and what stands in the way of the defense sector's switching to a peacetime track? This is the topic PRAVDA's correspondent discusses below with G. A. Koshevarov, general director of the Vega-M Scientific Production Association.

[PRAVDA] Gennadiy Alekseyevich, Russian statistics maintain that the manufacture of military products will drop by half this year as compared with last year, while total outlays for defense production conversion will rise by a factor as large as 23. In this connection, it is planned to draw financing of the expenditures largely out of the state budget. What can you say in this regard?

[Koshevarov] I am skeptical when it comes to forecasts which are so optimistic. Conversion is proceeding with difficulty; some officials are overly primitive in their interpretations. For example, plants formerly produced highly complex machinery, but now the advice "from above" is to "retool for baby carriages and pressing irons." There is a use for everything in the economy, to be sure. But why degrade highly-qualified specialists, people who were the pride of the defense sector? If we are to change our manufactures, we must offer work befitting the application of these high-order qualifications.

Speaking of financing via the state budget, the state has no money for that. Commercial banks and other non-state structures have little interest in investing capital in defense enterprises, especially in science-intensive manufactures, which provide a return not today or tomorrow, but in terms of years in the future. The new businessmen are concerned largely with receiving a quick return on the ruble and amassing a fortune. They do not have state interests in mind.

[PRAVDA] Exactly in what is your NPO [Scientific Production Association] engaged?

[Koshevarov] Our lead enterprise is the Moscow Scientific Research Institute for Instrument Design; the association produces airborne early detection and traffic control systems, aviation and space type integrated radar systems, radiometric instruments, navigation equipment, and much more. We do have something to take to market. An example is an air traffic and emergency control facility designed on the basis of the A-50 aircraft system. (The Western counterpart is the AWACS.) It makes it possible to provide operational control for safe flight of civilian aircraft in areas suffering a natural disaster, in "hot spots" of interethnic conflicts, and in other emergency situations, in cases where ground-based equipment may not be functioning.

[PRAVDA] That appears to be quite expensive: keeping your A-50 aloft for hours.

[Koshevarov] All you need do is recall the earthquake that occurred in Armenia and the crash of the Soviet and Yugoslavian transports into a mountain in poor visibility as they were executing a quick response for aiding

the Armenians. Timely assistance and the rescue of people and equipment justify all costs.

Another application of the A-50 is guiding airliners of foreign companies over sparsely populated areas of Siberia and the Far North. There we have no ground-based air traffic control facilities. Our systems could constitute a kind of aerial bridge as a complete replacement for air traffic controllers.

Aircraft and space surveillance radar is referred to figuratively as an all-seeing eye, for it makes it possible to obtain in an instant a high-grade image at any point of the earth's surface.

[PRAVDA] Can it also pick out small objects?

[Koshevarov] Of course. The resolution is very high: several meters. In addition, special mathematical processing takes away interference from the images.

[PRAVDA] What do you mean by that?

[Koshevarov] Well, let's say that we are using our apparatus to obtain from space a view of an area of the Amazon River in South America. The lush tropical vegetation would not let us obtain a quality image by ordinary photographic means, but the radar surveillance makes it possible to "remove" the vegetation and take a look under the jungle growth.

[PRAVDA] Does this mean that we could have a look into snowdrifts and ice in our North?

[Koshevarov] Yes, indeed. It is generally known that quite a number of pipelines run through Russia's northern territories. The pipes, which carry petroleum and gas thousands of kilometers, are buried in tundra a depth of two to three meters. The high temperatures to which they become heated cause the permafrost to thaw somewhat, with the result that the pipes tend to "walk." Lines have been known to migrate tens—even hundreds—of meters from their initial site. In case of an accident, a dig can be started in tundra in a particular location, while the actual petroleum spill is occurring elsewhere. The employment of patrol aircraft equipped with our apparatus makes it possible to conduct reliable monitoring of pipeline condition and the associated environment.

Hydrologists resort to drilling hundreds of wells in deserts in their search for water. Our system does this faultlessly: the radar eye sees through the earth to a depth of tens of meters.

Or take the case of guiding ships over the Northern Sea Route. This is a very responsible and an essential activity. The disintegration of the USSR deprived us of a number of ice-free ports in the Black Sea and the Baltic. This means that the Arctic lanes will be subjected to much greater pressure. The space type SHF radiometer will take care of strategic ice survey, while the solution of tactical problems will be aided by the helicopter-borne laser radar.

[PRAVDA] Tell me, please: Are foreign countries aware of your developments?

[Koshevarov] It so happened that our defense sector kept quiet. There was no advertising of any kind. The first time we displayed our products was at the Le Bourget (France) Air Show last year. This elicited the immediate interest of many foreign firms, including ones of developed countries.

Of course, it is possible to take an easier route: concluding a number of advantageous contracts. However, a number of highly interesting ideas and developments would be deprived of Russian precedence and be forever lost to our Fatherland. I do not think that anyone in Russia would benefit if, say, not we, but foreign countries would start using items created by Vega-M, such as a unique device for examining the human eye, a medical tomograph, an automatic radar [avtoradar], or apparatus for measuring soil moisture and managing cotton field irrigation.

Science, the same as culture, stands helpless before the market. Science must be supported in all possible ways. There is a need for laws which would promote investing in conversion sectors and would encourage banks and other commercial structures to finance the manufacture of the highly modern items Russia so badly requires. Until this is done, all conversion can do is mark time. And this is the time to get started.

Conversion May Lead to Loss of Sensitive Information

93UM0266B Moscow *RABOCHAYA TRIBUNA*
in Russian 11 Dec 92 p 3

[Article by Lev Rudskiy: "Blind Conversion Is Terrible."]

[Text] These cautionary words resounded recently at the Center for International Commerce, at a conference organized by the Russian Chamber of Trade and Industry [TPP]. Participating in it were heads of administrations and chairmen of oblast and kray Councils of Peoples' Deputies of Siberia and the Far East.

The vice president of the TPP A. Kolomeychuk expressed his concern at the fact that now when the conversion program is developing widely at defense industries, one can observe a leak of very important information abroad. Many national inventions and new technologies are not patented. And therefore essentially secret documents, whether on diskette or in some other form, are being sent to other countries. It is not impossible that we will soon have to buy these technologies for hard currency.

Maley Press Conference on Nadezhda Joint-Stock Company

93UM0291A Moscow SELSKAYA ZHIZN in Russian
22 Dec 92 p 4

[Article by B. Sadikov: "'Nadezhda' Is Feeding Soldiers"]

[Text] "Well I must say that today it is very pleasant for me to speak before journalists," stated Russian Federation Presidential Advisor M.L. Maley at a press conference devoted to the activities of Nadezhda Joint-Stock Company. "It's no secret that recently we have all become accustomed to the fact that neither we nor our money are building. But here—everything is ours."

What made the advisor so happy? What did the new organization use to win him over? Nadezhda has undertaken the resolution of the most acute problem for Russia—providing housing to officers, warrant officers and their families. Here are some figures that directly characterize the hopelessly bad situation here. Today owning their own home or apartment—is a lifelong dream, based on the most modest calculations, for 200,000 Russian citizens who have tied their lives to the army. Along with family members, that is approximately one million people. Meanwhile, the capabilities of the Russian Ministry of Defense housing construction permit us to build 41,000 apartments and to acquire in addition a little over 5,000 apartments through shared participation in their construction by the end of this year. The Russian Federation Presidential Edict on the Elimination of the Housing Debt through the efforts of executive organs of power locally is practically not being realized (but what edicts are being carried out?!). So, only 1,343 apartments have been received of 20,500 planned in the first six months. And that, as they say, is still not evening. The adopted law on defense stated that the strength of the Russian Armed Forces in peacetime should not exceed one percent, that is, it should be reduced by a factor of two by 1995. Just as many will need housing.

But a year ago Nadezhda became involved with the solution to this problem. Vladimir Sergeyevich Novikov, a retired colonel, an energetic and tenacious man who has housing construction experience, headed it. Vice President of the Russian Union of Industrialists and Entrepreneurs and President of the Association of Joint Ventures L.I. Vaynberg and General Director of the

German Firm "STV" H.Yu. Bode became his first assistants and financiers. Novikov found an unusual, original way to resolve the issue. All of us remember the recent slogan "By the Year 2000—A Separate Apartment for Each" which, alas, has also hung in the air. As a result, there has remained an enormous quantity of unfinished buildings throughout all of Russia—there's no money. Nadezhda has begun to finish building these uncompleted buildings. Its representatives take a facility, come to an agreement with local builders and finance the venture. There is a dual and maybe even a triple benefit here—this construction method permits us to gain time, to save, and what is very important, to reduce the cost of housing.

Already in March the new organization concluded an agreement with the Western Group of Forces (WGF) command authorities on supplying housing to servicemen. Not for those who are coming home from abroad in any organized manner and in whole units but for those who are ending their service and who are being released into the reserve or for those who are retiring. Today, no one wants anything to do with them. They are perhaps the most unprotected officers and warrant officers. According to the agreement, a serviceman pays 25% of the cost of the housing and the Ministry of Defense pays the remaining 75%. Right now the WGF is transferring the first 62 apartments and there are another 600 in line. Contracts have been concluded for financing and construction of 2,500 apartments in Kostroma, Kaluga, Penza, Podolsk, Klimovsk and Odintsov (Moscow Oblast), Smolensk, and Novgorod. Negotiations are being conducted with the administration of Mzhaysk, Zvenigorod, Orenburg and Orsk. In the next two years, Nadezhda must transfer up to 10,000 apartments to the WGF and payment is being made based on a fixed cost that does not depend on inflation. Moreover, while concluding an agreement with Nadezhda, the future apartment owner indicates in the agreement the location of the proposed residence and the size of the apartment that is appropriate for him.

It was especially pleasant for me to learn that quite a few servicemen have expressed the desire to acquire cottage homes in rural areas and want to return to the land and work on it. For now, Nadezhda is buying these structures but in the near future it intends to build them itself (incidentally, the cost of a cottage is the same as for a three-bedroom apartment). Imagine what hard-working, tempered people will soon appear in the depopulated villages of the Non-Chernozem zone...

Director of Arzamas-16 Interviewed*93UM0298B Moscow ROSSIYA in Russian**No 41, 7-13 Oct 92 p 15*

[Interview with Vladimir Belugin, director of the Federal Nuclear Center of Russia, by Vladimir Gubarev under "Closed Cities" rubric: "From Whom Can We Recover the Price of the Atomic Bomb?"]

[Text]

[Gubarev] Vladimir Aleksandrovich, I have the feeling that your family name has some connection with the Volga?

[Belugin] You are right. There was a village in Simbirskaya Guberniya whose inhabitants caught beluga [white sturgeon]. That was a special occupation among fishermen that unfortunately is now forgotten.

[Gubarev] How did you wind up in Arzamas-16?

[Belugin] Arzamas-16.... This population center has changed its name three or four times just in the last 45 years. But the interesting thing is that I came here three times. The first time was even before the war. Then during the time of the evacuation—with my father from Kramatorsk, where he worked. In Arzamas, which is on all maps, they "split" the train and sent half of the people to "Uralmash" and us here, to Sarov, the location of Plant 550, where they were then expanding the production of projectiles for "Stalin organs" [multiple rocket launchers].

Here I finished school in 1948 but for a year they did not let us go anywhere. Then, however, the director of the "installation" P.M. Zernov did manage to obtain a permit for our departure. Pavel Mikhaylovich understood that one must think about the future. One could go to only four cities of the Volga area. The aviation institute was in Kazan, where I went to study.

After the institute, I went to the aviation plant. We built engines for superlong-range bombers. By the way, they were the most powerful engines at the time. I worked a year as a senior foreman. It was a good school.

The "thaw" began in 1956 and they were recruiting the second group of specialists at the "facility." For initially, in 1946, they brought mostly nuclear physicists here, all those who could help. They have since become acclimated at the "facility" and the young generation of physicists grew up. Therefore the new group is made up of designers and engineers. When I heard that they were accepting people for my native "Volga office," I immediately said that of course I will go! So I ended up here for the third time.

I first came to the plant and then I became a designer.... Then they asked to move to management and for some reason I agreed. I later regretted that and wanted to go

back but I have now been here since 1972. I gave up normal work and became an ordinary Soviet administrator.

[Gubarev] Do physicists inherit a sense of humor?

[Belugin] You cannot get along without it in our business. We deal with work that is too serious and therefore physicists prefer to joke in their free time.

[Gubarev] So you replaced General Negin at the post of director of Arzamas-16....

[Belugin] Yes, and he now says that it is presently incomparably more difficult to work as director than it was previously.

[Gubarev] Why?

[Belugin] They are always telling us that we have to go to the West and study there how to manage enterprises or institutes. An American manager does not know one-tenth of what I have to do.

I became convinced of that in Czechoslovakia and in the United States, where I had the occasion to visit.

For example, they do not give thought to how to feed people and where to get sausage, meat, milk, and potatoes. They do not realize that people have to be provided with housing and children with day nurseries and summer camps. There must be transportation operating on the streets and enough power not only for production but also for the city. Add to that hot and cold water and gas so that—pardon me—the purifying mechanisms will work. Medical facilities must function normally. The director is also responsible for normal operations. In general, there are a great many very diverse problems that their director does not even suspect. I do not want to discuss the nuances but there are many more shortcomings in our system because they deal with their immediate business, whereas our system may have been more economical but nevertheless less ideal.

[Gubarev] More economical?

[Belugin] Yes, certainly. Our work and developments cost a fraction of what they do in the West. For some reason, no one appreciates this but it is a reality. This is so not just at our institute but also in our industry, in particular in the defense industry, which I know rather well. Perhaps it makes sense to go over to their system but the first thing that needs to be done is to pay people tens or even hundreds of times more. Then the individual himself will provide himself with housing, food, and recreation and the directors of enterprises will not have to deal with this any more. But this is not yet the case. So how does the work of the director now differ from what it was in the past? Then we really had security from the state. Paper with a red border.... If it came to some plant, everything was set aside and our demand was carried out. That is how it was under Stalin and Beria but that kind of a system was maintained for many years after that. I remember the following event in my

practice. When we were preparing a "session" in 1958 (we called a series of tests a "session"), we needed 2 or 3 kilograms of mercury for some purposes. That immediately went through the appropriate state structures ("immediately" meant within a few days) and we received the mercury. It is true that for a time the country had no thermometers.... Or take supply questions. It is foolish to transport sausage from Moscow, for example. We did that, however. Of course that was in the first years.

But the enterprise is growing, as is the city, and products are needed locally. A meat combine was built right next to us and 99 percent of its output was for us. The quality was wonderful, better than in Moscow. Then this gradually began to disappear.... At first the oblast committee reduced our share to 70 percent—that is where the sausage went, because they love good products there too. And now they pay no attention to us whatsoever.

[Gubarev] Your grievances are understandable. But still, the country was without thermometers because of you....

[Belugin] If we are speaking about a specific case, then this is incorrect. But if we look at the problem as a whole, it is true. I will explain. Any country must have objectives, whether it be Nicaragua or Russia. Obviously one of the chief goals is to be an independent, sovereign, and respected state. And this requires a certain foundation and consequently the allocation of the necessary resources. This was done previously. It is another matter that it was sometimes done through barbaric methods. But there were tasks, goals were set, and therefore there were results. But now there are no tasks....

[Gubarev] Maybe it just seems like that to you? You have the primary task of building ideal nuclear weapons that meet current requirements. Is that right?

[Belugin] Yes, but not entirely. The main thing is that there is no certainty in our business. The president of Russia came to us and said that we are needed. He said it so that everyone could hear him. Prior to that, a number of public figures, ecologists, and scientists had said that we are not needed, that we are capable only of harming the planet. Now it has been said that we are needed! But under our system and structure, it seems that that is not enough. For no one respects either the laws or the rules. The uncertainty is the main thing that is afflicting us. After all, we are not asserting that everyone must build nuclear weapons and a lot of them. We agree that it is necessary to cut back, to reduce them to a certain minimum that guarantees security. But no one yet knows what "security" and "sufficiency" are. Everyone considers himself a little Napoleon, who knows, of course. But there is no state policy. There must be some kind of security doctrine that defines the place of nuclear weapons. I stress: "together with specialists," because politicians alone can make such a mess that it will then take many years to justify oneself and to correct things, if it is still possible to do so. Unfortunately, there have been many such examples in the recent past as well

as today. So they defined the place of nuclear weapons in the military doctrine and a long-term program is now supposed to be established for it. This is mandatory for any production system. Even if you want to grow bananas, you still cannot get along without a program. People must know how needed they are and what they are going to do this year and 5 years from now. I am primarily talking not about production but about science and scientific developments. Then comes certainty and efficiency and everything else—in general, everything that is positive.

[Gubarev] Neither the politicians of the past nor those of the present can establish such a doctrine by themselves. It is obvious that you must have your own state policy with which you can go to the government, the Supreme Soviet, and the president. Do you now have such a policy? It is another matter whether or not you agree with it but at least there is a subject for discussion and decisions.

[Belugin] We have already appealed to Gorbachev and Yeltsin with proposals. We have our understanding of the problems. We do not pretend to have the final truth but we do have our own understanding of the role and place of nuclear weapons in the contemporary world. We have stated it many times, with different secrecy stamps, and have sent papers "upstairs." It seems to me that that is all that we have been doing in recent years. We simply pursued Gorbachev but he never deigned to answer us. Once he merely wrote a resolution saying that one must deal with this but after that there was silence.... The political perturbations did not bring anything good for us. We want to cut back the administrative system but it actually got larger. New people are showing up all the time and the structures are unstable. Traditions are being lost. Traditions are quite good. It is another matter when they are allowed to dry up, for they must be renewed and improved. But new people come with no knowledge of tradition and, saddest of all, without any understanding of the problems. Sometimes they ask such naive questions that you simply are perplexed as to why they ask them. For this reason, it is difficult to demand anything serious from such people. By nature, nevertheless, I am an optimist and therefore I hope that things will stabilize in the near future and the problems of security and adequacy of defense will be resolved and hence the place of nuclear weapons in our lives will be defined.

[Gubarev] Could you briefly, without figures and secret data, characterize the nuclear weapons program?

[Belugin] So that every housewife will understand?

[Gubarev] Yes. After all, you exist not for presidents and not for governments but for all of us.

[Belugin] This is difficult, because it would seem that security problems are far removed from the individual and his daily needs. The housewife understands that she needs a kilogram of sausage, bread, and milk but why does she need a bomb? A new generation has arisen

whose sense of danger has atrophied. Formerly the society swung in the other direction; when the war ended, they said: it is necessary to make sure that it does not happen again. And it may be that this was not used in the best way. It is quite natural that such huge volumes of production are not needed. In my view, it is necessary to pay more attention to the development, design, and improvement of weapons, and not just nuclear weapons. But to produce them in huge quantities is senseless. The country has a very large scientific base that has not yet collapsed. It must be preserved, because it can be reoriented rather quickly for any items that the country needs. Defense production needs to be supported at a minimum level but primary attention (and consequently, financing) should be paid to science and developments. They are the basis of the development of the defensive branches. But the place and role of nuclear weapons? It is necessary for them to respect you, for them to understand that they cannot trifle with you with impunity. If I know that my neighbor in the village has a young pig, I can steal it....

[Gubarev] Is there really such an inclination?

[Belugin] I know that he has a young pig and I do not have one but would very much like to. My neighbor is weak and I come and take it. But if there is a danger that he will at least hit me with a load of salt in one place, then I will think thrice before I covet his pig. It may be that this is not a completely apt comparison but it came to mind just now.

[Gubarev] It is justified: after all, we are explaining nuclear strategy to housewives. A young pig is quite convincing.

[Belugin] One involuntarily gets the feeling that we are starting to resemble the weak neighbor. If one takes a close look at international affairs, one cannot fail to notice the behavior of some Western politicians: they are showing a tendency to deal with us as though we were a third-rate country. Such a thing was unimaginable just recently. Yes, I am subjective but our conversation is frank and therefore I consider it unnecessary and dangerous to conceal my own opinion. It seems to me that if we continue to erode our concepts of the country's security and of its defense and army, then the intervention of some "Blue Helmets" or other "benevolent persons" is quite realistic. A great country is above all respect for it and its power, which must be known in the world. I am not talking about superiority over others but it is essential to maintain parity. At your request I am not going to talk about specific figures on nuclear weapons but one thing is clear: they must be modernized substantially. We made weapons over decades. They did to. But the Americans are not sleeping; they are improving their weapons. We also did that, above all in the name of security. Nuclear weapons must be made more efficient, that is, the necessary objectives must be guaranteed with less.

[Gubarev] Let us dwell on the security of weapons. What do you understand that to be?

[Belugin] There are new principles. They are known to us and to the Americans. Above all, there must be no dispersion of plutonium, including in any accidents or acts of terrorism. And this requires testing. Not in the scope of before—significantly less but it is still needed. We must greatly reduce the list of weapons. Nuclear forces must be independent. After all, the concepts of "strategic" and "tactical" nuclear warheads are purely conditional. Tactical weapons can do as much harm to the enemy and to yourself as can strategic weapons. The dispersion of nuclear weapons within the branches of service is dangerous if nothing else because the army is disintegrating.

[Gubarev] Do you think that scientific, design, and engineering personnel are still capable of guaranteeing the security of nuclear weapons and their current level?

[Belugin] Certainly. We are capable of guaranteeing this for the time being. Precisely so—for the time being!

[Gubarev] So today everything depends not on the possibilities of science and specialists but only on political decisions?

[Belugin] Only.

[Gubarev] Does it not seem to you that a very major mistake was made in the last decade? So many nuclear weapons were stockpiled here and in the United States that there are now enough of them for each country to destroy the world 10 or 15 times over. The term "new thinking" implied: it is sufficient for us and the United States to retain enough nuclear weapons so that the "coefficient of destruction" is one. And then we could reduce the level of armament by a factor of 10, thereby reducing by a factor of 10 military expenditures, which have now reached truly astronomical figures on the planet.... Why do we need 30,000 warheads? Do you not feel some guilt of your own in the fact that you did not demonstrate to the country's political leadership the senselessness of the nuclear arms race? I stress precisely you, because you knew the true situation better than did the politicians.

[Belugin] We warned about this 5 and 7 years ago but they said to us: "It is none of your business!" Now about guilt.... It is possible, of course, to pound your chest with your fist and to repent. But neither scientists nor weapons developers (and I consider myself one of them) experience such a feeling, because we had a different psychology. After all, you cannot view any event in the past from the positions of today without taking into account the situation in the world, the psychology of people, and the real circumstances. Our task was to guarantee the security of the country. We were not involved in many questions. We knew our own secrets and kept them but we had no notion of the quantity and especially of the targeting of our "products." Those were secrets that we were not supposed to know. I will not

hide the fact that we felt that something was wrong. By the way, [that was] long before perestroika, when they began to put pressure on us. Not very strongly but we began to sense the shortage of resources or, more accurately, the signs of that shortage. And we began to be indignant: Why are such enormous resources not being used correctly? We proposed: let us put the lid on some particular direction and concentrate our efforts on this other one.... We know what the Americans have. We know that our range of weapons is substantially broader. We proposed: it is necessary to make cuts and direct resources precisely into those advanced developments that promise a great effect in the future. To be honest, however, we ran into a stone wall.... No, we do not feel any guilt. We were taught that we are on the cutting edge, that 40 years of peace on the planet is also to our credit, and that we are dependably guaranteeing the defensive capability of the Motherland. We respected ourselves for this and others respected us.... Later we began to feel that there are too many incompetent people "at the top." Later, at first on account of individual incidents, we suddenly realized that the advisers on nuclear weapons of the leaders of our country are people who have no understanding of them. Here we rang all the alarm bells but unfortunately they did not hear them and are not hearing them. Are they deaf or something?

[Gubarev] Here is a more general question. Tell us people who are far from Arzamas-16 what the institute represents?

[Belugin] This is a mighty institute with enormous capacities that are being used at only high strength today. By inertia it is still moving forward, for it has a huge mass. Because of traditions and the possibilities that it has been given, the institute is still trying to do something. But if the situation does not change, the movement will stop.

[Gubarev] The Americans and French now want to cooperate with the institute. Suppose that you are French and came to Arzamas-16. And they decided to show you everything. What will surprise you most of all?

[Belugin] What they do not have in France.

[Gubarev] And what do they not have?

[Belugin] I still know very little about France. The Americans are another matter. They have a lot. By the way, they use their resources very efficiently. But we use these resources many times more efficiently! Yes, it is precisely so. They are financed hundreds of times better than we are. But they are hundreds of times more expensive than we are. We are much less costly. In general, that is true of everything—the material base, the budget, the remuneration of the developers. We, and hence our weapons, cost the state a fraction of 1 percent as much. And, for the time being at least, we are doing the same thing.

[Gubarev] And if it is not 1 percent but 10 percent as costly, will you live a lot better?

[Belugin] And how! We will be as rich as Croesus!

[Gubarev] As director, what are you most proud of?

[Belugin] The people above all. And, of course, the traditions. They were established by hundreds of people and developed over decades. Our area was established relatively recently, it being one of the youngest. From the very beginning, they were inculcated with the fact that they are doing something that is very important and very necessary, without which the country cannot exist, and very dangerous. The people developed a sense of great responsibility....

Unfortunately, our traditions of responsibility and of a serious attitude toward the assigned task and toward danger may be discontinued, because the two or three generations who began and created nuclear weapons are gradually leaving the scene and we have practically no young people. Whereas in the best times we took 500, 600, or even 800 young specialists from the best institutes, now they simply are not coming to us, because there is neither any housing nor any funds for wages. The traditions may end, the old folks will leave, and it will all be over.... There will be a material base and excellent facilities but there will be no specialists. It is extraordinarily important to maintain traditions. This makes it possible to hope that someday everything will be revived. Because in principle all the rest is either there already or can easily be made.

[Gubarev] Can I ask an impudent question? Is there a problem in contemporary science and technology that your collective would not be able to resolve?

[Belugin] There probably is such a problem. Well, for example, how to rejuvenate the human organism.... By the way, we are also interested in biological problems. Thus, we are thinking about one from the well-known ophthalmologist Fedorov—there are ideas on how to get wounds to heal quickly, in the course of a few minutes or even faster than that.

[Gubarev] It is necessary to close the nuclear center at once and apply all of its effort to precisely these problems. I am sure that the means will be found at once!

[Belugin] All jokes aside, do not forget that we have unique facilities, including laser, plasma, and other installations. And today we are thinking about how to utilize them most efficiently in various areas. On the one hand, we have a quite imposing material base. On the other hand, however, it is inadequate, because the interests of science are always broader than the available possibilities. All of our technology is based on the ideas of the 1970's but was realized in the 1980's. There are facilities that are the best in the world and Europe but they are already obsolete, because we know how to make them better. This is an endless process. For example, we have the "Iskra-5" laser. What the Americans have is stronger. I was at their installation and saw it. I must say that their engineers are not a bit better than ours and in

some areas they may even be behind us. Their installation is very bulky. And it costs a hundred times what ours does.... In short, we have a very extensive base and we can use it to resolve various tasks at the level of the 1980's. If we speak of the 1990's and the coming century, then it is essential to build new facilities. Take, for example, the "BGR," the world's most powerful impulse-graphite reactor. It is very compact, with an active zone of only about 1 meter, but it has the output of a large hydroelectric station.

Here we have applied a number of technical and engineering solutions that the Americans have not yet been able to implement, because they do not have such a reactor. And we can already make it better and more powerful. For this we need 10-15 million rubles at the old prices. But we will not find them today. The Americans have recognized that they are about 15 years behind us in lasers with nuclear excitation. They have admitted that they learned from us and their leading specialists did their dissertations using our materials from back in the 1970's. There are areas in which we have surged far ahead but they are now catching up very quickly, for they have unlimited possibilities in comparison with ours, both financial and otherwise, and they are simply paying more attention to them.

[Gubarev] Can it be said that "times of stagnation" have come for us just now?

[Belugin] Yes, that is quite right! They used to ask us how things were in the time of stagnation and we did not understand what they were talking about. We did not experience that—we simply worked. But now we are beginning to understand what "stagnation" is and we are gradually disintegrating.

[Gubarev] What is special about your center? I have in mind science in the broad sense.

[Belugin] We always had a narrow objective—to build weapons. But to achieve that objective, it was necessary to work in a very broad range of scientific interests. It was necessary to investigate and establish new branches—in measuring, impulse, and high-speed registering technology. And one other special feature: we did not have the right to use anything imported. Our area could not depend on international supplies, that is, we worked only with our own equipment and materials. We were obliged to depend only on our own strengths.

[Gubarev] There is the nuclear warhead, the atomic bomb. Tell us, what in the world is more complex than this "article."

[Belugin] That is a contradictory question. It can be said right away: many things! But you have to see things differently—not from the point of view of a static ready device but of all the work on it. Then they can say firmly that there is nothing more complex! If you take the expenditure of intellect and the multiplicity of the extremely complex tasks that need to be resolved, then of course there is nothing. If you look at the design and the

finished product, then a rocket engine or something similar is much more complex and you cannot even count the nuts. The diagram of a nuclear bomb is quite simple but it is an extremely complicated matter to translate it into a real structure. After all, it is a matter not only of superhigh temperatures and pressures but also of an extremely short time. And all of that must be synchronized.... It would seem that the human being is incapable of comprehending what is happening and his reason refuses to understand.... That is how it is in the English Parliament, according to a well-known anecdote. They immediately approved 100 million pounds sterling for military expenditures but the stoker demanded another 30 pounds, for otherwise, he said, it will be cold in parliament. They deliberated for 3 days, because they all understood very well what 30 pounds are, whereas the 100 million is a particularly abstract figure. Just as are a million degrees and nanoseconds.

[Gubarev] The problem that we now face is that of disarmament, in particular the dismantling of nuclear warheads. Is this possibly a less complex task than that of the creation of the warheads themselves?

[Belugin] There are no complications from a technical point of view. You just need the same conditions with respect to responsibility, attitude toward the work, etc. In this case, the dismantling is incomparably simpler than the creation. Here, to put it crudely, you need experience, responsibility, and understanding of the task. We have more than enough specialists capable of working that way. Fortunately, they have not yet run off to various cooperatives and associations. From an ethical point of view, nevertheless, the dismantling of weapons is more complex. After all, these operations will be carried out by the same people who assembled weapons for decades. And they knew all their lives that this labor is needed for the Motherland and now seemingly is not needed.... To a certain extent, this wrecks human hopes.

[Gubarev] For decades you spearheaded nuclear armament but now the reverse process has begun. Is nuclear disarmament possible without you?

[Belugin] You know very well what I will answer—it is not possible! Any honest person, even if he is not very well versed technically, understands this very well. Any job, especially one that is dangerous and vital, must be accomplished by people who understand it. For it is not enough to have good intentions. I may want very much to do well but I will be powerless if I have no experience, tradition, and understanding of the danger. There can be no doubt that the entire process of disarmament must be handled by professionals. Thank God we have enough nonprofessionals in administration, in politics, and in various commissions and committees. But there the consequences are less injurious, or at least they do not show up immediately. Here the consequences of incompetence and a lack of professionalism will appear at once....

You should not think that we are complaining, however. We are simply obliged to think about the future and for this reason we are not dozing. Psychologically, of course, it is difficult for us to change our nature, for we are sure that Russia needs our work, that is, nuclear weapons. Right now we do not know how much we are needed: 20 or 30 percent. And we are talking not so much about financial help as about definiteness. When they tell us that here is a specific program for 10, 15, or 20 years, then we can tell the people clearly what the defense part is. It requires some specialists—work while observing traditions, responsibility, and all the rest. The fundamental part of the institute is also being secured. You cannot get along without science. And finally, the third part—the commercial part. We have unlimited possibilities. We can not only feed our own people but they will feel better than in the defense industry.

We have taken on, for example, the intensification of the production of oil. The Americans ask huge sums just for test work. But with the help of cumulative charges we can break up rock down to 200 meters, which makes it possible to double or triple the production of oil. We carried out tests and gave our conclusion that our methods are significantly less expensive than those of the Americans. We can handle any task but we need definiteness. This is the main thing. Right now, however, we cannot tell the people to go and do some particular task. For tomorrow they may be needed for basic work but it will be impossible to bring them back. After all, the human being is not a toy and it is inadmissible to play with his fate.

[Gubarev] Are you counting on private capital?

[Belugin] We have a number of programs that no merchant is capable of financing. For example, there is the efficiency of power transmission throughout the country, the problems of sources of current, and so on. These are tasks for the state. Commercial projects are intended for a year or two or maybe for as long as 5 years. And they immediately yield results. In essence, we are using what we have accumulated over many years. True, unusual tasks also arise that have to do above all with the processing of agricultural output. Oil mills, hulling mills, etc. We are currently trying to make sugar modules. It turned out that no one in the world is dealing with them—they are just building large-scale plants. But I am certain that our lads will get it done.

Thus, by the way, we have already made an attachment for the "Belarus" tractor to handle glaze ice on the roads and we devised a vacuum cleaner capable of replacing dozens of yard sweepers. We are offering all of this to the authorities of various cities, telling them to take it, for it costs just pennies. It turns out that no one needs it! Wherever you look, there is indifference. Forty percent of the fatal accidents on the seas and rivers are because of our own stupidity. There are no elementary rescue systems. We built them: a raft inflates instantly upon contact with the water. We made it better than what the Americans did! We tested it with river transport workers

and they confirmed its very high quality. And this too, it turns out, is something that no one needs. They are reluctant to pay money for a rescue system, because the norms for accidents indicate that 40 percent of the passengers are supposed to drown in an accident.

We have myriads of such developments.

[Gubarev] We can finish our conversation on this note. It is clear to people that you can do more than just make nuclear bombs. Still, there is one other question: What, in your view, is the future of the institute?

[Belugin] I am an optimist. Bearing in mind our people and our traditions, I am convinced that we will not fail. We just need definiteness and the rest will work itself out. Or more accurately, we will do everything ourselves. For the time being, however, we are forced to wait. In some measure, our discipline is telling. And we must not lose it either. We know that difficult work lies ahead and there may be certain losses. But there may be successes as well and we therefore look to the future with confidence.

Tula Small Arms Director Interviewed

93UM0309A Moscow KRASNAYA ZVEZDA in Russian
17 Dec 92 pp 2,4

[Tula Cartridge Plant Director Vasilii Andreyevich Shiryayev interviewed by Aleksandr Golts: "Dumb Bullets, Smart Plant"]

[Text] The Tula Cartridge Plant is not as well known in Russia and abroad as its output. And this is hardly because the plant, which was established in 1937, began being called by a name corresponding to its field only two years ago (before that it was known as the Kirov Plant). It's just that this is the fate of the entire defense complex, a fate shared by the Tula Cartridge Plant as well: to be in the shadows, behind a curtain of secrecy, and in wartime—both the Great Patriotic War and the cold war—to be a kind of invisible front, about which we still know very little.

Our discussion with Vasilii Andreyevich Shiryayev, general director of the Tula Cartridge Plant Production Association and USSR State Prize winner, began with this subject.

[Shiryayev] Indeed, even in military encyclopedic literature you won't find a word about our plant or about hundreds of other enterprises. And yet this is an enormous part of our history, a part that still awaits its researchers. I can't understand why, in digging through archives today in search of the new and unknown, the subject of the defense industry is ignored. This is where discoveries await these researchers, and not the kind of "scandalous" discoveries that are in style today and that are as short-lived as ephemera, but major and true discoveries that will help people better understand our history and our people's soul. After all, defense complex employees hold a special and important place.

Take, for example, our plant. The making of cartridges in Tula began 150 years ago, and for the past 55 years this has been our work. During the Great Patriotic War, the plant was almost completely evacuated to Nitva and Yuryuzan. Using the equipment that was left behind, our people continued to produce small-arms ammunition and to repair rifles, machine-guns, and mortar launchers. From January 1942 to 1944, the volume of our ammunition production grew every month. And so our contribution to the Victory is no small one, for which the plant was awarded the Banner of the State Defense Committee for eternal keeping. In the postwar period, the plant was awarded the Order of the Red Banner of Labor for its creative efforts, modernization, and assimilation of new products. One surely doesn't have to be a specialist to understand that weapons development invariably includes the development of cartridges. Without modern ammunition, there can be no modern army. And our plant has done much to ensure that the country's Armed Forces have effective armaments. For example, we were the first to assimilate the production, in a very short time, of the 5.45-mm caliber cartridge; we are the only plant that produces cartridges for the Makarov pistol and other arms.

[Golts] But cartridges, as I understand it, aren't your only product.

[Shiryayev] You're absolutely right. We make cartridges for sporting and hunting rifles, as well as five calibers of brass shell cases (the only ones in the country) for commercial hunting—12, 16, 20, 24, and 32. The range of consumer goods we have assimilated is also wide.

[Golts] Did you start producing them as a result of conversion?

[Shiryayev] Not exactly. The fact is that the plant has always made civilian output, ever since the postwar period. At that time, the sharp decline in arms production led to the first conversion. We made spoons, forks, irons, telephones, underground drilling rigs, telpher lines, VK-2 calculating machines, and chains for grain-harvesting combines (incidentally, we still are still making them). In short, we have never been aloof from the needs of the national economy.

In 1989, with the start of a new conversion for us, we began making equipment for the food industry—machines for cooling caramel (the NOM-2) and filling it with flavoring, coloring it and mixing it with dried citric acid. For the Agro-Industrial Committee, we began making steam ovens (the A-9 KVD) for cooking preserves, tomato products, syrups, and jams and for frying vegetables and meat.

We produce the country's only bellows and bellows-type compensators. Use of the compensators in heating systems provides a significant savings of fuel and energy resources. Incidentally, the team of designers of that unique product was awarded a 1990 State Prize.

We have assimilated the production of medical instruments, such as the ultrasonic Krioton-Lor-2 surgical device, designed for destroying neoplasms and altered biological tissues, as well as a device for stomach resection. The latter device, already tested in clinics, has drawn the interest of the well-known American firm Johnson & Johnson. There are proposals for establishing a joint venture.

Our output also includes air ionizers for the effective use and conservation of gasoline in automotive transport (2.5 to 3 liters are conserved for every 100 kilometers), diamond-tipped dental drills, wood furniture, children's toys, and other goods. In the future we plan to install a line for producing tile and a number of items for rehabilitating the disabled.

In the near future, we intend to produce containers for storing vegetables in a gaseous medium and bicycle chains, which used to be made in the Baltics and which we now have to buy for hard currency. We are starting to produce bimetallic plates for producing chemical current elements, which are in short supply in our country. We're going to make grinders and shellers for private farmers, household gas cylinders with a capacity of up to 50 liters, and also cylinders for fueling motor vehicles that run on natural gas.

[Golts] What about the cartridges for sporting guns and hunting rifles? They are already in very short supply, and with the Russian President's edict permitting the sale of hunting rifles to farmers, they are going to become scarce indeed. Do you intend to increase their production?

[Shiryayev] Of course. We have started making 12- and 16-caliber shell cartridges.

There is also another presidential edict—on the sale of gas cylinders and gas pistols. We have designed our own gas pistols and intend to put them into production in early 1993, along with cartridges for them.

[Golts] Do you fear competition with other plants?

[Shiryayev] The model that makes the best showing will be the one to survive on the market. We hope it will be ours. In addition, there will no doubt be a tremendous demand for these personal defensive weapons. But it's not our plant that is responsible for the increased demand for them, although I have read and heard such charges against us—claims that we are arming the country. The wholesale increase in crime and people's defenselessness—that's the reason.

[Golts] But let's return to the problems of conversion. You, Vasiliy Andreyevich, are one of the defense complex's longest-serving executives.

[Shiryayev] Yes, I'll soon turn 60. I worked at the Novosibirsk Low-Voltage Equipment Plant for 11 years, and in 1967 I was transferred here, to the Tula Cartridge Plant. I served as chief engineer for five years, and in 1972 I became head of the plant.

[Golts] As a result, you can probably compare the postwar conversion with today's.

[Shiryayev] Their main difference is that the earlier conversion was a planned one, was implemented under strict state supervision and control, and was accompanied with the appropriate subsidies. This time conversion came all of a sudden, in mid-1989. They told us: Do as you see fit, and without any prior warning they took away half of our program. As a result, in the first year our production of basic types of output fell by 30 percent, and the association lost up to 90 million rubles in output production and 30 million rubles in profit. We waited for a conversion law for almost three years, hoping that it would at last dot all the "i's" and that things would get easier for us (although conversion should have begun with the adoption of such a law). But when it finally came, it had been so watered down as to be of no practical benefit for us.

It is surprising that for all our orientation toward the West these days, we don't want to see the positive experience there. I went to the United States not very long ago. They have a nationwide conversion plan there, one that provides for compensation of losses. We visited California, where production of defense-industry output is being reduced by 4.1 percent every year, while in our country we are cutting it by 30 percent to 50 percent all at once. Only in Russia are people able to endure such ordeals.

[Golts] But there is another problem that people seem not to notice. You are assimilating different kinds of output in the course of conversion. But how do you decide what to produce? Is there in our country any coordinating agency that studies consumer demand and the capabilities and plans of defense plants? As it is, they invest enormous sums of money to produce the same kinds of products—for example, food processors—while tomorrow, as a result of overproduction of them, everything will have to be done all over again.

[Shiryayev] This question seriously concerns me too. For no one in Russia is managing this process as yet. There is a market research institute, but we don't sense any real influence or help from it. And so the principle "survive as best you can" is operative here as well. We are groping our way, acting on intuition, operating at our own risk. For example, we decided to produce a universal food processor capable of 24 operations. But when we learned that several plants were already making the same thing, we began having second thoughts. We might choose to make a very simple model of food processor.

So this problem is of the same order: First a wholesale reduction in the defense production, then an equally wholesale, "independent" shift, with each plant taking his own path, to consumer goods production. This is not going to create civilized competition, as some would have us believe. It is going to strike another powerful blow to our much-suffering economy.

[Golts] And so another legitimate question arises: If you switch to consumer and other products, won't our Armed Forces be left without small-arms ammunition?

[Shiryayev] Some say that the army has already stockpiled more than enough such ammunition. But that argument doesn't hold water. First, if you have surplus output, sell it. Second and most importantly, if we want the army to have modern ammunition, it has to be constantly improved. If we stop doing this, we'll fall about 10 years behind the technically developed countries in just one year.

As you can see, the situation is complex. But we have been encouraged lately by the fact that the legislative and executive branches have begun paying attention to our problems. They were discussed at the Seventh Congress of Russian People's Deputies. It was announced that state orders for the defense complex will be increased by 10 percent in 1993. True, if we are figuring in rubles and take inflation into account, the state of affairs is not going to improve. On the contrary, in physical terms these orders will be almost half of the current level.

Even so, I'm an optimist. The promised government aid (indexation of credits, the granting of greater economic independence to enterprises, and so on) is allowing us to live and work with greater confidence. But help is one thing; at the same time, we are relying on ourselves most of all, counting on our production and scientific-technical potential—and, finally, on our human potential. We have excellent people, and that's what keeps us going.

[Golts] Any kind of optimism has to have strong wings. What sort of plans do you have, Vasily Andreyevich?

[Shiryayev] First, we're going to pay attention to the social sphere, so as not to lose what has already been achieved in this area. We have several pioneer camps and vacation facilities, a sports complex with two swimming pools, nine children's preschool facilities, and a polyclinic. Back in 1985, we acquired a sovkhos, which meets part of our employees' needs for farm produce. We do not intend to cut back these expenditures, because concern for people is one of the biggest problems.

Second, we must normalize material and technical supply, in order to keep our production collectives supplied with work. We are using barter deals, actively working on the exchanges, and making use of the potential of the newly created Association of Metallurgical Plants, of which we are a cofounder.

Third, we are trying to obtain Russian government investments in efforts to reorient our production.

Fourth, we are actively seeking to enter the foreign market and establishing relations with foreign partners as concerns deliveries of military output and investments on their part. We have set up a business cooperation association known as INKONT in order to establish international contacts.

Fifth and finally, we are going to continue making every effort to develop and maintain new market relations. Today we are founders or cofounders of 10 small businesses, one mixed partnership, and three limited partnerships.

[Golts] In other words, your plan is to learn how to make money.

[Shiryayev] Yes. But contrary to the widely held opinion, we have never sponged off the people. Throughout the plant's operation, consumer goods have always accounted for at least 30 percent of its output. And for every one ruble in wages, we produced 1.5 to 2.5 rubles in consumer goods. In other words, we not only earned our pay, but we also fed someone else. So when conversion is complete, the defense complex, in view of its enormous scientific and production potential, will continue to give a boost to many other enterprises.

Weapons Plutonium Plant Chief Interviewed on Conversion

934P0041A Moscow *EKONOMIKA I ZHIZN*
in Russian No 48, Nov 92 p 13

[Interview with Valeriy Lebedev, director of the Krasnoyarsk Mining and Chemical Combine, by V. Khrebtov, in Krasnoyarsk-26; date not given: "'Samsung' from Krasnoyarsk"]

[Text] Reporters from *EZh* first visited the super-secret Krasnoyarsk Mining and Chemical Combine, which produces weapons-grade plutonium, in April of last year. We spoke about plans for the enterprise, connected with a conversion in production, and about the possibilities of a financial and economic development for the combine (*"EZh"* No. 14, 1991).

One and a half years have gone by since then. Was the enterprise collective able to implement its plans? How are reforms coming at this huge and super complex production plant?

Valeriy Lebedev, director of the combine, answers these and other questions at the request of the head of the regional information center of *"EZh."*

There have not been many changes. Two nuclear reactors, with the aid of which weapons-grade plutonium was made, have been shut down. Thus, basic production, which in many ways ensured stable financial and economic well-being for the combine, was partially curtailed.

Shutting down the reactors, however, was not a tragedy for us because the combine had earlier planned a new strategy for developing its production and had prepared to implement it operationally.

The basic direction for this work that is new to us consists of producing exceptionally pure substances for microelectronics. Thus, for example, the combine already has the capability of producing especially pure aluminum, which is used for electronic evaporation on integral circuits. Our volume of output is 4 tonnes per year. If one considers that

no more than 50 tonnes of this material is used in the entire world, it becomes evident that our capacity is rather solid. In the coming year we are counting on increasing production of this material up to 10 tonnes per year and fully satisfy the needs of all the CIS countries.

In addition, we have begun production of especially pure tellurite, bismuth, gallium, and other super components for microelectronics. We are preparing for a capability to produce a poly-crystalline silicon and arsenide of gallium.

Recently we created special thermo-electric elements, with which we can produce portable refrigerators and heaters. Next year we hope to begin experimental production of these items.

In only half a year, one of the combine shops installed an assembly line and mastered production of television sets of the well-known South Korean firm "Samsung." Before the end of this year, 13,000 units will be produced, and next year—over 20,000. We are prepared to increase output of these items if enterprises can be found to purchase complete units for cash. If we succeed, the combine would be able to deliver television sets to them on most favorable terms.

As a result of conversion, the combine was able to increase its ratio of civilian production from 2 percent to 20 percent. But no less important is the fact that implementation of the conversion program helped us create 1,200 new jobs.

[Interviewer] Valeriy Aleksandrovich, Many enterprises in Russia and the CIS are having a fit because economic ties have broken down and, as a consequence, supply of materials and equipment is sporadic. Has the combine been able to avoid this fate?

[Lebedev] We were able to avoid it for most of our production. We understood right from the beginning that the breakdown of economic ties cannot be reestablished easily, and for this reason, during our conversion planning, we tried to take into consideration the political and economic instability of our society and to aim at using local raw materials for our new production.

In sum, the combine receives all raw materials, other materials, components, and equipment either from "distant foreign lands" or from our nearest neighbors—the enterprises of Krasnoyarsk Kray. For example, we use raw materials from the local aluminum plant for producing especially pure aluminum; but for producing especially pure bismuth telluride we use waste from the output of the Krasnoyarsk non-ferrous metal plant. We understand of course that we are forced to take these drastic measures, but so far we do not see another solution.

[Interviewer] The introduction of new output is always connected to many problems, not only technical, but financial and economic, as well....

[Lebedev] You are correct, and among these problems the main ones are the decrease in productive labor,

decreases in the volume of production, and decrease in income in the face of rising prices. These are the circumstances that by and large are holding back our enterprise from taking major steps to reequip our production plant.

Reality is such, however, that added to these natural and objective factors are subjective ones—excessively high taxes, percentage interest rates on loans, a total lack of preferential terms for investments, unjustifiably high prices for equipment, a lack of turnover funds, and a negative balance of payments for most enterprises. After all this, should anyone wonder why Russian enterprises are only reluctantly going for modernizing their production? They simply do not have the resources, nor are the necessary conditions present to take this step.

Paradoxically, conversion has thus far not brought the expected dividends to our enterprise either. In many cases this can be explained by most of our customers' inability to pay. For example, the milk containers that we produce were selling like hotcakes before. Today, though, at the relatively low price of 35-40 thousand rubles, farmers have stopped buying them because they have no money.

As a result, even though we are ending the year with a positive financial balance, the combine owes its suppliers 1.8 billion rubles, while our customers owe us 3.2 billion. Also, the deficit in the turnover funds is around 20 percent at the combine. We had no choice but to stop construction of housing, and social and cultural facilities, since we now have funds enough only for wages and for purchase of raw materials and other materials for basic production.

[Interviewer] *Valeriy Aleksandrovich, many of your customers are complaining about the unjustified increase of various goods and services. As a practical person, you undoubtedly are familiar with the components of expenses.*

[Lebedev] Yes, we analyzed them carefully and came to the conclusion that prices are "inflated" not so much by the middlemen as by our current tax system.

For example, what does a single value added tax cost us? Before the goods reach the consumer, they go through 5-6 or more (depending on their complexity) steps in production, each of which "slaps on" 28 percent to its selling price. Finally, the merchandize ends up in a store and is overpriced because it has a number of unjustified price hikes built in. Essentially, the Value Added Tax (VAT) has turned into a turnover tax.

Add a group of taxes for the wage fund, comprising a total of 38 percent, and (again, at every step of production) numerous local taxes, and you will understand that it is these taxes that put our merchandize out of the reach of many Russians.

I think the time has come when it is necessary to reexamine not the tax percentage rates, but the entire tax structure. Revenues going to the state treasury should be flexible enough to be used for stimulating production and use. Today, however, we see not only a decrease in demand, but also a fall in the supply of goods and services.

[Interviewer] *The last question, which brings up arguments not only among directors as a whole, but also among members of the government: Should enterprises of the military-industrial complex be subject to privatization? Or, as before, is it their fate to stay under state "protection"?*

[Lebedev] Definitely. There are facilities throughout the whole world that are exclusively under state jurisdiction, an example being dangerous radiation enterprises. But even they have been auctioned off, with the difference being that the controlling number of shares belongs to the governments of these countries, and those governments determine the strategy and safety measures for the existence of their enterprises.

A similar form of privatization would be fully acceptable here also. Moreover, shares of facilities of the military-industrial complex that are not dangerous, I think could and should be sold to all who want to purchase them. The defense interests of the state would not be so difficult to take care of in that circumstance, since the state would have the right to grant contracts for military production based on specific conditions. Also, the safeguarding of military secrets is a purely organizational problem that is fully capable of being resolved.

It is important to understand one thing: The entire world is going this way. Is it worthwhile for us to "reinvent the wheel"?

[Interviewer] *We'll then, your point of view is clear, and we hope it will be heard by all interested parties.*

[Lebedev] Thank you.

Our interviewee's "business card":

Valeriy Aleksandrovich Lebedev was born in 1941. After completing his studies at the Krasnoyarsk Polytechnical Institute, he did graduate work at the Moscow Energy Institute, specializing in "Nuclear Facilities." He worked as shift chief and chief inspector of a nuclear heat and power plant. As of 1989 he has been Director of the Krasnoyarsk Mining and Chemical Combine. He is a Candidate of Technical Sciences and a Senior Lecturer.

Energia Combine Seeks Western Partners

934P0038A Helsinki HELSINGIN SANOMAT
in Finnish 22 Nov 92 p B 8

[Article by Sven Wikstrom: "Vyborg Region Wants New Enterprises, Tourists, and Improved Harbors"]

[Text] The research institute, NPO Energia, is located south of Vyborg, around 20 kilometers southeast of Primorski (Koivisto) in the area of the former Humaljoki village.

The residences, stores, and schools of the combine's workers are built near the shore of the Gulf of Finland. The research institute is built farther from the coast.

During the most intense years of the cold war and the space competition between the superpowers the institute employed about 2,500 persons. In the last decade the number of people began to decline. Now about 1,000 persons work at the research institute and about 400 persons are employed in the schools and other service facilities of the combine.

Research Institute Is the Biggest Employer

The research institute is the largest employer for the 6,500 inhabitants of Primorski. Concern about their own future and that of the city has caused the production installations and secret research institutes to be opened up. A solution for the problems of the former Koivisto township was sought at a Finnish-Russian seminar on Friday and Saturday.

The difficulty of the situation might best be portrayed by the wish expressed by Aleksandr Zilitinchevich, the chief engineer of the institute, to the Finns at the seminar: "A lot of hopes for the further development of the city are tied to this occasion."

Zilitinchevich considered it unfortunate that only a few of the Finns were still in the audience in the afternoon. Most of them were looking for souvenirs or engaged in other projects. The most conscientious ones engaged in negotiations with entrepreneurs from the Vyborg region. Some provisional agreements were even arrived at.

Enterprises have been privatized in the Vyborg region at a rapid pace. By the end of the year there will be more than 60 additional companies.

Travelers from Finland

The city of Primorski is placing its hopes on new enterprises, a commercial harbor, and an increase in Finnish tourism. It is intended to develop a group of three harbors in the Vyborg region. It is estimated that about 5 million tons of goods could be shipped through Vyborg, Uura, and Koivisto. In the division of labor Koivisto's share would be lumber and container traffic.

The hopes for tourism are nourished by freer movement than previously and the possibility of renting land to former residents of Koivisto, among others.

According to K. P. Morgunov, chairman of the Vyborg region property committee, the law permits land to be rented to foreigners, while buildings and apartments may be sold. The regions decide on the sale. The Primorski District, among others, can decide on rentals, according to Morgunov.

Rocket Engine Builders Are Learning New Duties

The research institute Energia, which specialized on engines, instruments, and fuel for spacecraft and military aircraft, is seeking to cooperate with companies from Finland and other Western countries. The institute, which is located in Primorski (Koivisto), is ready to open up its area, which up to now has been closely guarded

with a triple electric fence, to entrepreneurs who are able to provide employment for the people at the institute.

The institute, which ranks at the top in the country with regard to its know-how, has found new civilian production through its own efforts in name only. At the institute prosthetic devices and individual installations for the food industry are made. There are plans for bagging Chinese tea and bottling Georgian wine unless something else is found.

The scientific director, Vyacheslav Kuznetsov, admits that the situation is very difficult. He said that the government orders had fallen by a third and were still falling, perhaps to half of the level of recent years or even lower.

Peaceful Space Programs

"The situation here is at least as bad as elsewhere in the war industry of the former Soviet Union." Right afterwards he corrected himself by saying that the work remaining at the Primorski research institute belonged to the peaceful space programs. According to him it was no longer a war industry.

The know-how of the institute's own researchers so far has brought only one civilian application up to the experimental stage. A prototype of the Vulcan cleaner has been developed from the cleaning system for the rocket engines fuels and gases. The small apparatus is claimed to be very effective at cleaning gases, waste water, industrial emissions, and toxic wastes. It is possible to build fixed installations of various sizes and also versions that can be carried on trucks.

Because of the lack of government orders, the people at the research institute work a four-day week. On Friday peace and quiet prevail in the workplace. Most of the machines are unattended, and only a few are in use.

The chief engineer of the research institute, Aleksandr Zilitinchevich, promised space and workers more skilled than the average to those who would establish joint ventures. In addition to product ideas Zilitinchevich wants enterprises going into joint operation to bring along new manufacturing technology.

Laborers Are Good but Machines Are Bad

The managing director of Jasvasko Oy operating in Mantta, Jaakko Vastamaki, visited the research institute on Friday. Expectations turned out to be much bigger than the reality that was seen.

"When one thinks that the institute has operated in space technology, one has to say that the conditions and facilities are surprisingly primitive," the Mantta machine shop director commented. "Relatively demanding work is done in the machine shop on old manually operated machines."

According to Vastamaki, this would indicate that the machine shop men are really highly skilled workers.

In the sheet metal section the yeast vat that was being built for a St. Petersburg food company received a completely opposite verdict from Vastamaki. "The welding results were ghastly," Vastamaki said.

Kirov Tank Plant Struggles for Survival

93UM0259A Moscow TRUD in Russian 2 Dec 92 p 2

[Article by Dmitriy Struzhentsev under the rubric "Conversion Experience": "Reality Past and Present of 'Tankograd'"]

[Text] St. Petersburg—There is probably no need to explain to anyone what the Kirov Plant in Petersburg is. It is the former Putilov Plant. That plant which, even prior to the revolution, was considered one of the largest not just in Russia but in Europe as well.

During the years of Soviet management the giant of industry was turned into a monster of the military-industrial complex. Suffice it to say that it produced up to 25,000 Kirovets tractors annually even during the so-called times of stagnation. These accounted for only half of the association's total production volume. The rest was made up of tanks, unique turbine plants for submarines.... The Kirov needed the conversion like no one else, needed it like the very air.

Conversion, you will recall, is the thoroughly conceived, planned reduction of military production and gradual replacement of military products with civilian items. During this process the production facilities are retooled and updated, production is reoriented....

At the will of the Russian government, however, all military orders were eliminated at once, without fanfare, and a good half of the production capacities—and therefore the workers as well—found themselves out of work.

The tank and turbine operations came to a halt this past summer, and the tractor assembly line stopped (it seems that Russia has no use for 25,000 tractors today), workers in the main shops were sent on a forced two-month leave....

What was the independent trade-union committee to do in this difficult—actually, disastrous—situation? Let me say right off that it took the route of threatening a strike, which has become fashionable today, because it knew very well that no kinds of demands or ultimatums would help matters. The administration, headed by P. Semenenko, the association's general director, and the trade union worked out a common position at the negotiating table. These are its main points: save the unique production facility, do everything possible to avoid mass lay-offs of highly skilled workers and veteran specialists, and pay the association's workers no less than the average wage for other workers in Petersburg's industry. This is a leader, after all.

After an appeal consistent with this position was made by the collective to the government, the latter did not remain indifferent to the fate of the "Kirov." Despite the

meagerness of the state budget, the association still received several million rubles, and this helped the Putilov people to "keep their heads above water."

The plant arrived at the conclusion that the giant could not survive in a market situation without altering its structure. Without state orders it would be impossible to keep all of the numerous production facilities loaded with work and materials. And a decision was born—again jointly. It was to decentralize production, to allow each facility its own current account and the authority to go after orders.

At the trade union's insistence the provision was added to the official duties of each shop chief that he was personally responsible for providing his section with orders and retaining jobs. Previously, the chief demanded only one thing: "meet the plan." His main commandment today is: "Give the people work." If he succeeds, good for him. If he fails, he surrenders his position to a more capable and energetic person. Now, every plant and complex has to seek its own client, either within the association or outside, conclude a contract and load the ship with work.

The trade union organizations also had to be restructured. The trade unions of plants and complexes were replaced with councils of shop-committee chairmen. Each council elects its leader. The shop committee is no longer elected but is made up of trade-union group. The trade-union committee issues to the group organizers credentials as representatives plenipotentiary of the independent trade union in their sections. And all of this is not just a formality. Today there must be efficient and daily communication between the trade-union committee and the collectives.

One other change has recently occurred at the Kirov. The former "Tankograd" has become an open, joint-stock company.

Just what has been the outcome of all these innovations? To put it in general terms, an indomitable will to survive and a striving for enterprise and creativity has appeared in all the plant and shop collectives. Every Kirov subdivision now looks for jobs and works to master the production of new items. No one is any longer in a state of passive anticipation. While formerly the association produced only one agricultural tractor model for the national economy, today it turns out 28 modifications of the Kirovets: bulldozers, vibrating rollers, truck tractors, even special derricks for oil-well repairs. No one any longer pursues the tens of thousands of tractors. Every order precisely is oriented. Kazakhstan requested 2,000 tractors; it got them. the same goes for the Volga region, for Orenburg.... They could not get along without the Kirovets in that kind of expenses.

The tractor manufacturers now produce only 5,000-6,000 tractors for the grain fields annually. The rest are produced to fill orders for many different branches of industry.

In August, following the collective's forced two-month leave, the association operated 4 days a week. It has now gone to a five-day week.

There are more than enough ideas. It is just difficult to implement them in our difficult times. Prices have been the death of many a good plan. They considered building trolleybuses for the city. They calculated the expenses and decided that this would bring the plant to financial ruin. They could make steam locomotives, but there is no one to finance the undertaking. They came up with the idea of producing minitractors for private farmers. They built prototypes capable of competing with foreign counterparts. The problem is that 30- to 40-horsepower diesel engines are not produced in Russia. Purchasing them abroad would add to the cost, and there is no foreign exchange. There appeared to be no solution. But no, the KamAZ auto-makers took a liking to the Putilovets (the name given to the tractor). It was decided to purchase 500 diesel engines abroad and produce 500 minitractors at the Kirov for private farmers. The Tyumen people succeeded in buying 300 diesels and turned them over to the Petersburg manufacturers. They too were impressed with the Petersburg minitractor.

The Kirov Plant and KamAZ are now planning to form the Putilovets, a joint-stock company for the production of these machines. The auto-makers will produce the engines, while the Petersburg people will build the actual tractors. Nor has the turbine plant been left without work. Together with a West German firm it has developed a new unit for gas-pumping stations which will increase their capacity by 9-11 percent. The cost of implementing the project was far less than the future gain to the client, the Russian gas industry.

Russia's first jeep was also developed in Petersburg. It incorporates all of the best features of the UAZ, the GAZ, the ZIL.... The cross-country vehicle is attractive and sturdy. Its future is still uncertain, however. It is very expensive. Prices are creating perhaps the association's main problem today. The Kirov Plant is, after all, an assembly enterprise depending upon more than 2,000 suppliers. The Yaroslavl engine-makers were providing the motors for 400,000 rubles each in September, for example, whereas the same motor cost 650,000 at the beginning of November.

There are more than enough problems. The increased cost of materials and assembly parts is only one of them. Low wages are another. "Is our labor actually worth less than the manning of some stall?" the tractor-builders ask with indignation. Just try to explain the logic of that.

An agreement was reached in the association, which states that the plant management regards the trade union as the only public organization representing the interests of the collective and that the administration will coordinate decisions affecting the interests of the workers with the trade union's opinion.

There is a folk saying to the effect that "there is some good in everything bad and some bad in everything good." Who knows whether a real business partnership would develop between the trade union and management if not for our present difficulties? And experience has taught us that it is easier to overcome any problem by working together.

I just finished the article, when it occurred to me: Was all of this worth writing about? Perhaps the reader will ask: "My good man, why have you gone on this way about a plant as though it were still the times of 'stagnation'? Today everyone is writing about commerce, businessmen, crime, accidents, fires.... And here you are writing about a plant...." Perhaps that is valid. But then the quality of our life depends mainly not upon the shopkeepers and hawkers, not even upon the newly appeared businessmen and financial moguls, but primarily upon industry, which we have gradually forgotten. We must not forget about it entirely. If the plants shut down, what are the businessmen going to sell? Vouchers perhaps.... No, we must write about the plants, about those who work there. It is absolutely essential.

Petersburg Defense Plant Conversion to Agricultural Production

93UM0253A Moscow SELSKAYA ZHIZN in Russian
15 Dec 92 p 2

[Article by I. Selivanov: "Tractors in Place of Tanks"]

[Text] Agricultural machine-building is becoming the main area of production for St. Petersburg's defense enterprises. It was pointed out recently at a conference of the Council on Conversion in the Northwest Region that within the immediate future around 20 percent of all the facilities of the VPK [military-industrial complex] will curtail their output of military products and 45 percent will convert entirely to the production of consumer goods.

The conversion will also affect naval bases in the eastern part of the Gulf of Finland, which are relinquishing their wharfs to the civilian fleet, and numerous scientific research institutes in the defense field, where tractors will now be designed instead of tanks.

LAND ARMS

Likhachev Converted Vehicles

93UM0232B Moscow *TEKNIKA I VOORUZHENIYE* in Russian No 9-10, Sep-Oct 92 (signed to press 26 Aug 92) pp 6-7

[Unattributed article: "Quickly, Comfortably, Economically"]

[Text] Transportation equipment of the Bluebird complex will deliver specialists and cargoes to hard-to-reach areas. Its makeup includes three cross-country vehicles, the ZIL-4906, ZIL-49061 and ZIL-2906. Their mechanisms, assemblies and machine units are standardized to a considerable extent with corresponding assemblies of motor vehicles series-produced by the Moscow Motor Vehicle Plant imeni I. A. Likhachev.

Novelty of Vehicle Design:

- glass-reinforced plastic body;
- front and rear wheel drive;
- independent torsion suspension;
- disc brakes with hydraulic and pneumatic drives.

Technical Characteristics

Indicators	Make of Cross-Country Vehicle		
	ZIL-4906	ZIL-49061	ZIL-2906
Load-carrying capacity, kg			
With crane	3,400	2,025	500
Less crane	5,000	-	-
Total weight, kg	11,800	9,550	2,000
Speed, km/hr:			
On roads	75	80	12
Afloat	8	9	13
Minimum turning radius, m	10	10	-
Range, km (hrs)	900	1,250	(4)
Type of propulsive device	Wheeled		Rotary screw

ZIL-4906 All-Wheel Drive Amphibious Cross-Country Truck

Equipped with air conditioning, water-removal and automatic fire extinguishing systems. Outfitted with radionavigation system and intercom device and adapted for airlifting. Designed for operation with ambient air temperatures from -50 to +70°C.

ZIL-2906 Rotary-Screw Cross-Country Vehicle

Intended for moving over water, marshy areas and virgin snow over 500 mm deep. Movement is by a nontraditional method using a rotary-screw propulsive device. It can be transported in the body of the ZIL-4906 cross-country vehicle.

ZIL-49061 All-Wheel Drive Amphibious Cargo-Passenger Cross-Country Vehicle

Has air conditioning, water-removal and automatic fire extinguishing systems. Outfitted with radionavigation system and intercom as well as a set of devices for airlifting. Reliable operation in the tundra and on mountainous-marshy terrain with ambient air temperatures from -50 to +70°C.

Send orders for manufacture of the cross-country vehicles, for their joint production, as well as for purchasing licensing and know-how to the following address:

109280, Moscow, Avtozavodskaya, 23, Moscow Motor Vehicle Plant imeni I. A. Likhachev.

Telephone numbers for inquiries: (095) 277-89-11; (095) 277-28-32.

COPYRIGHT: "Tekhnika i vooruzheniye", 1992

New Family of KamAZ Trucks

93UM0232C Moscow *TEKNIKA I VOORUZHENIYE* in Russian No 9-10, Sep-Oct 92 (signed to press 26 Aug 92) pp 14-15

[Article by Lieutenant Colonel V. Golovnev, Lieutenant Colonel G. Lukyanov, candidate of technical sciences, and Lieutenant Colonel A. Saburov under rubric: "Practice-Opinions-Advice": "New KamAZ Family Motor Vehicles"]

[Text] The KamAZ-43114 and KamAZ-43115 all-wheel drive vehicles based on the KamAZ-43101 and KamAZ-43106 motor vehicles presently have been prepared for production at the Kama Motor Vehicle Plant. Their main technical characteristics are given in the table. The first vehicle is for transporting personnel and various cargoes, for mounting armament and military equipment, as well as for towing trailers over all kinds of roads and terrain. The second will transport cargoes over roads on which the vehicle axial load should not exceed 60 kilonewtons (6 tonnes-force).

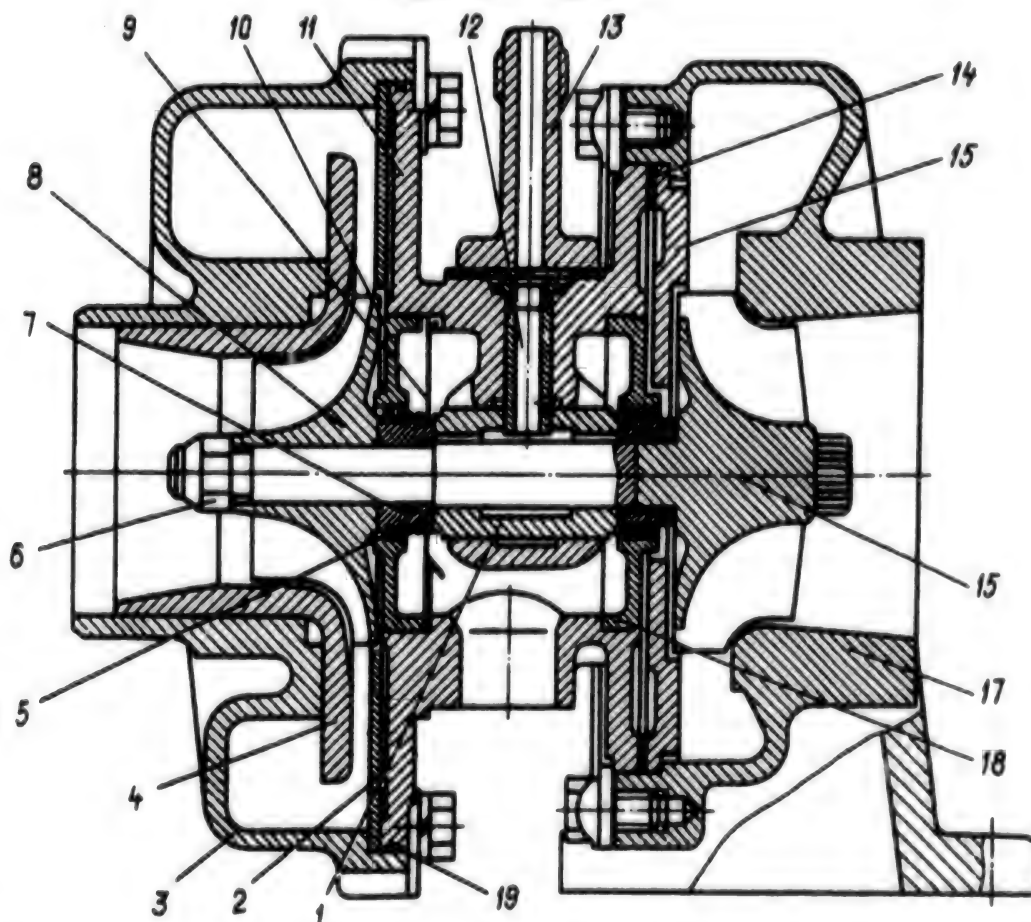
Indicators	Make of Motor Vehicle	
	KamAZ-43114	KamAZ-43115
Total weight, kg	15,420	16,130
Load-carrying capacity, kg	6,000	7,000
Weight of towed trailer, kg		
Over all kinds of roads	7,500	-
Over roads with axial load of 6 tonnes-force	10,000	12,000
Engine power, kw (hp)	191(260)	191(260)
Maximum speed, km/hr	90	90
Fuel range, km	1,000	1,000

A 191 kw (260 hp) Model 7403.10 diesel engine with turbosupercharging is installed in the motor vehicles. Its fuel system uses a Model 334 high pressure fuel pump with increased injection energy and smoke collector. The pump's nominal cyclic capacity managed to be reduced to 96 mm³/cycle by decreasing injection time, which is done by changing the cam gradient. A telescopic pusher is used to reduce effort on control system pedals. Engine operation is controlled using handles located in the cab beneath the panel: engine shutdown handle to the driver's right and fuel feed handle to the left. The cooling system uses a four-row

radiator, which increase the vehicles' operating reliability under hot-desert and high-mountain terrain conditions. Two fuel tanks with a capacity of 170 and 125 liters are installed on the motor vehicles.

There are two turbocompressors in the air supply system (Fig. 1). Air is taken in from the space above the cab (during summer operation) or from under the hood (when used in winter). An air cleaner is mounted on the engine and connected by hoses with the turbocompressors accommodated on intake manifolds.

Fig. 1. Turbocompressor:



Key:

- | | |
|-----------------------|--------------------|
| 1. Bearing | 11. Bearing body |
| 2. Screen | 12. Locator |
| 3. Compressor body | 13. Adapter |
| 4. Diffuser | 14. Gasket |
| 5. Sealing ring | 15. Turbine screen |
| 6. Nut | 16. Turbine wheel |
| 7. Oil deflector | 17. Turbine body |
| 8. Impeller | 18. Cover |
| 9. Oil scraper screen | 19. Sealing ring |
| 10. Cover | |

The KamAZ's have a Model 142 clutch similar in design to the Model 141 clutch. Their difference is that the number of springs has been increased to 8 and 24 respectively in the torsional vibration damper of the driven clutch disk and in the pressure device. In connection with this the clutch design supports the transfer of 15 kg(f)-m of torque.

The Model 14 gearbox is equipped with 4th and 5th gear synchronizers in which the profile of splines and toothed clutches has been changed. It uses strengthened primary and secondary shaft rear bearings. The gearshift lever ball joint is made with a polyurethane bushing, which precludes its vibration. Effort on the lever has been considerably reduced by changing the dimensions of intermediate linkage tips. Driving and intermediate shafts in the transfer case are mounted on reinforced bearings. Flanges of the driving shaft and of the rear axle drive shaft also are reinforced. Gearshift actuating mechanisms (Fig. 2) are activated by air using a three-position valve mounted on the cab instrument panel. If the pneumatic system is faulty or there is no air in it, the design of the drive permits shifting a reducing gear in the

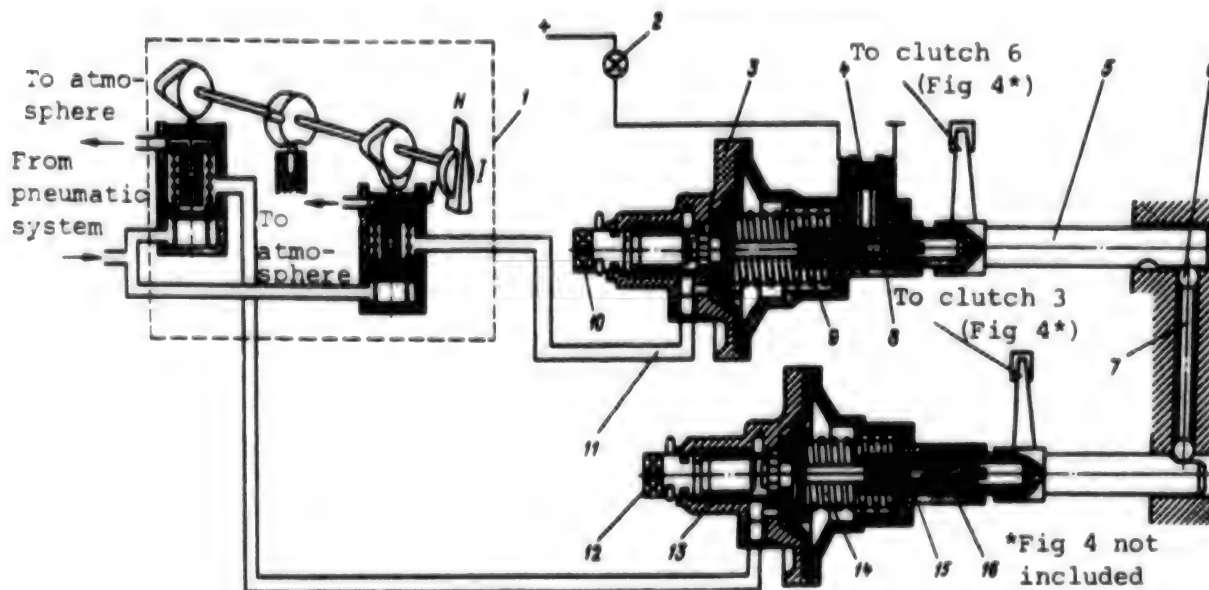
box, but in this case then it is possible to shift to a higher gear or neutral only manually with the help of screws.

Gaskets of synthetic material are installed in cardan shaft joints at the end of spider bearings to eliminate scratches and prevent overheating of journals. The splined joint seal has a telescopic cap and gland. Bearings of greater load-carrying capacity and dimensions are used in driving axles to increase their life. There is a clutch in the front rear axle and rear axle for locking the interwheel differential. Its control key is on the instrument panel.

The front wheel suspensions consist of two 15-leaf square-section springs (10x75 mm) and rear ones consist of a balance arm, two 8-leaf square-section springs (16x90 mm) and torque rods. To reduce labor-intensiveness of technical servicing, rubber-metal joints requiring no lubrication as well as nuts with cotter pins are used in the rods. The winch design provides for feeding out the cable forward.

Needle bearings are installed in the crankcase and steering gear side cover (Fig. 3), which considerably

Fig. 2. Pneumatic system for transfer case control:

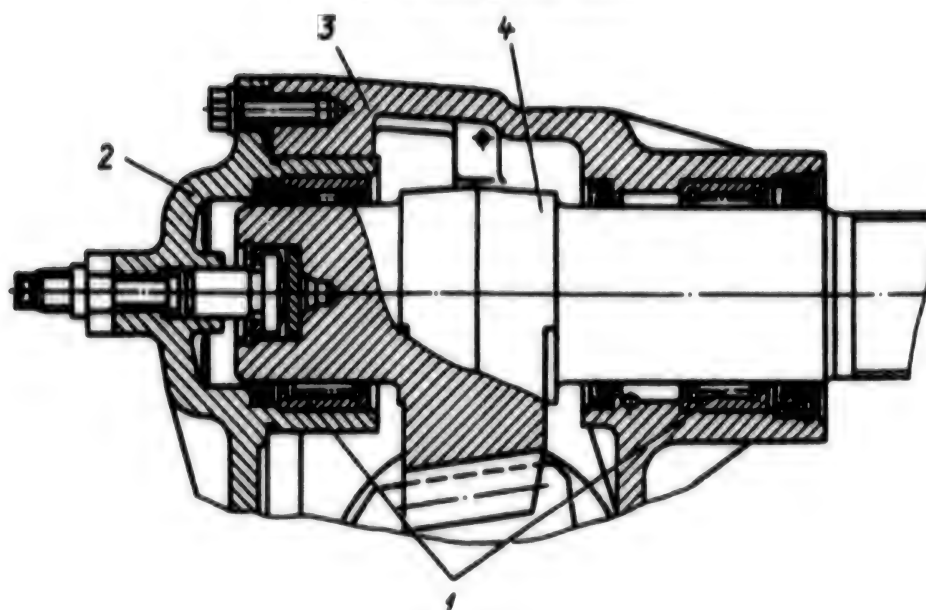


Key:

1. Gearshift valve
2. Downshift light
3. Gearshift mechanism
4. Downshift indicator light switch
5. Rod
6. Ball
7. Pin
8. Pressure spring

9. Return spring
10. Screw
11. Lines
12. Screw
13. Gearshift mechanism
14. Return spring
15. Pressure spring
16. Rod

Fig. 3. Steering mechanism:



Key:

1. Needle bearings
2. Side cover
3. Steering mechanism housing
4. Steering arm shaft

decreases effort applied to the wheel. The KamAZ-43114 braking system is equipped with a single-cylinder compressor with a capacity of 460 liters per minute, cylinder diameter of 92 mm and piston travel 46 mm. The vehicle cab is modernized. Its height has been increased and rotary door locks, three sun visors, cable window raisers, spherical rear-view mirrors and an additional right mirror have been installed. A more modern control instrument panel has been used.

COPYRIGHT: "Tekhnika i vooruzheniye", 1992

GRM-126 Transporter

93UM0232E Moscow *TEKHNIKA I VOORUZHENIYE*
in Russian No 9-10, Sep-Oct 92 (signed to press
26 Aug 92) pp 6-7

[Unattributed article: "GRM-126 Transporter: Offered for Sale to the National Economy"]

[Text] The vehicle design contains progressive engineering solutions. It can be used successfully in hard-to-reach areas for delivering geologists, gas workers, oil workers, builders and hunters and for transporting cargoes. The GRM-126 is equipped with an MK-10 small

multifuel kitchen, a 20 liter potable water tank and three external baggage racks. The equipment and property accommodated in them is guaranteed safekeeping even when moving over the taiga. Comfortable seats which fold into sleeping places are installed inside the lounge.

The MT-LB light tracked combination prime mover-transporter possessing high traction-dynamic indicators is used as the base. In addition, it is reliable and steady in operation.

GRM-126 Technical Characteristics

Type	Tracked, cargo-passenger, amphibious
Number of places:	
Sitting	11
Sleeping	4
Load-carrying capacity, tonnes	2.5
Weight of towed trailer, tonnes	6.5
Maximum highway speed, km/hr	61.5
Speed afloat, km/hr	5-6
Telephone numbers for inquiries: (095) 293-88-75, 293-33-54	

COPYRIGHT: "Tekhnika i vooruzheniye", 1992

Sterlitamak Brings Out New Nuclear-Capable SP Artillery Piece

93UM0203A Moscow TRUD in Russian 5 Nov 92 p 2

Unattributed news item: "Self-Propelled Gun for Sale"]

[Text] The Sterlitamak Machine-Building Plant made a presentation of a self-propelled artillery piece. This combat vehicle surpasses analogous world models in its characteristics. Suffice it to say that it can fire shells with nuclear charges. The electronic "insides" of the vehicle, which they were ready to sell to anyone wanting it, are also unique.

Businessmen and representatives of the diplomatic services accredited to Moscow displayed great interest in the combat vehicle. They noted, at the same time, that the advertising of the function was clearly insufficient.

Arzamas Offers BTR-80, Derivative Civilian Vehicles

93UM0250A Moscow KRASNAYA ZVEZDA in English 16 Dec 92 p 4

[English language advertisement: "Arzamas Machine-building Plant of Industrial Enterprise 'GAS' Offers"]

[Text]

BTR-80: ARMORED PERSONNEL CARRIER

Combat wheeled amphibious vehicle armored personnel carrier BTR-80 is equipped with powerful armament, reliable armor protection against fire of small arms and high maneuverability. The vehicle is designated for use in mechanized units of the army and marines. The number of crew and carried firers consists of 10 men. Hydraulic of the steering wheel, pneumatic booster of service brakes drive, spring booster of clutch drive, hydraulic drives of water jet propeller and of water deflecting shield, electric driven control of air ducts makes drivers working conditions easier. The BTR-80 is equipped with heating systems and starting preheater at subzero temperatures. Voltage of the board electrical circuit is 24 volts. Light and signalling devices installed on BTR-80 permit to use it on public roads. Four front steered wheels permit to make turns at radius 12.6 metres. Centralised tire pressure regulation system allows to automatically maintain, needed, depending on road conditions pressure and to compensate air bleeding from tyres when pricked, shot and maintain maneuverability of BTR-80. Combat proof tyres allow BTR-80 to continue movement at distance up to 200 km at speed 20 km per hour with zero pressure in tyres. BTR-80 from the move without preparation and disembarkation of the crew crosses water obstacles afloat at speed 9-10 km/hour, thanks to water jet propeller installed in the rear of the vehicle. Into the hull when afloat is the ejection system which on water jet propeller. Suspension of all wheels movement and evenness country conditions. Water,

penetrated pumped out by electric pump operates with switched independent torsion ensures high speed of travel under cross.

Protection of the crew and firers against weapons of mass destruction (nuclear, chemical, bacteriological) is provided by armored hull, its tightness, filtering and ventilation unit with centrifugal blower with absorber filter providing inertial separation of dust. The system supplies purified air into the zone of respiration of the crew and firers. For partial decontamination the vehicle is equipped with tank decontamination unit. Six launchers installed on the turret for launching smoke grenades, pipes and muffler of exhaust system with heat radiation protection, reducing possibility of vehicle detection by infrared devices and killing by ammunition with homing heads, fire fighting equipment starting from sensors in the engine compartment or from the button location on the drivers board. All this contributes into survival of the vehicle at combat field. For the crew and firers leaving and entering the vehicle in the roof of the armored hull there are 4 hatches and 2 hatches are in the sides between the second and the third wheels. For service of vehicle units there are several access doors closed by armored covers. The vehicle is equipped with entrenching tools, spare parts, accessories and drivers tools. There are special ports in the upper hatches for firers to fire at highly located targets.

Technical Specifications	
Crew	2+8
Configuration	8+8
Combat weight	13,600 kg
Power-to-weight ratio	19.1 hp/tonn
Length	7.65 m
Width	2.9 m
Height	to top of sight 2.035 m to top of turret 2.410 m
Ground clearance	0.475 m
Track	2.41 m
Wheel base	4.4 m
Max speed	road 90 km/h water 9.5 km/h
Fuel capacity	300 litres
Operating range	600 km
Fording	amphibious
Vertical obstacle	0.5 m
Trench	2 m
Engine	V8-cylinder diesel 260 hp at 2,600 rpm
Transmission	manual with 5 forward and 1 reverse gears
Transfer case	2-speed

Technical Specifications (Continued)	
Steering	power-assisted
Tyres	13.00-18
Suspension	torsion bar with hydraulic shock absorbers
Brake	hydraulic on all vehicles
Electrical system	24 V
Armament	main 1x14.5 mm MG
	coaxial 1x7.62 mm MG
Ammunition	main 500
	coaxial 2,000
Gun control equipment	turrent power
	contromanual gun elevation
	(depression +60°) -4°
	turrent traverse 360°

UNIVERSAL CROSS-COUNTRY AMPHIBIOUS CAR GAS-59037

The car is designed on the base of BTR-80 chassi for the use in that fields of national economy which need to be provided with transport operations and industrial processes in the absense of passable roads, to get over water obstacles (at construction sites, energy system services, geological works, fuel-energy complex, rescue works, accidents, earthquakes and floods).

FEATURES:

1. Hermetical water-tonnage body;
2. Cabin with heating;
3. Tires with regulated pressure;
4. Hermetic load platform with folding sides;
5. Water ejecting mechanism with steering device to drive afloat;
6. Water pumping system;
7. Windlass;
8. Possibility to place special equipment on the car base.

CROSS-COUNTRY ARMoured CAR GAS-59032

This car has excellent performance qualities and is fully covered with armour. Having 18 bullet holes each wheel still maintains at grade owing to a special pumping system. It continues to move even if 5 out of 18 wheels in any order have been torn away with a grenade.

The car is amphibious, capable to get over water obstacles. Windows are screened with armoured shields.

It needs no roads. Margin of motion with one fuelling is 600 km. Highway speed is up to 100 km/h.

Accommodation facility is 10 persons at a time and there is space enough for carrying large sums of money or other valuable equipment. It can be used for transporting cash; as a watch or towing vehicle; as a platform for carrying special equipment, apparatus and other means of various assignment.

Address: 607220, Arzamas, 9 May str., nr. 2. Tel. 2-07-80, 2-26-33, 2-84-78. Fax: (8-83) 147-2-36-56. For telegrams: Arzamas, Nizgorodskoj, "Motor". Russia

AEROSPACE SYSTEMS

Missile Conversion for Light-Satellite Launch

93UM0233A Moscow *TEKHNICA I VOORUZHENIYE* in Russian No 9-10, 92 pp 43-45

[Article by Professor Yu. Solomonov, doctor of technical sciences and director of the "Kompleks" Scientific and Technical Center: "Conversion of Missile Technology: Dream or Reality?"]

[Text] The dynamics of modern life are forcing us to look differently at many questions of the vital activities of the domestic defense industry. Its military missile sector is not exception. One can assess from various points of view the effectiveness of international agreements on limiting missile weapons, but it is obvious that the general trend of reducing nuclear missile arsenals is one of the basic directions of the policy of super-powers. Projecting it on the "earthly" concerns of industry associated with the development and creation of modern missile technology, one can establish a substantial reduction in state appropriations for these needs. Therefore, the enterprises must structure their activities in such a way that they are guaranteed a stable position in conditions of the lack of or significantly reduced budget financing.

One variant of solving this problem can become the use of military missile technology for peaceful purposes on a non-budget commercial basis. This, in particular, is the implementation of Project "Start" [Launch], based on using technologies used in mobile land-based missile systems known as SS-20 and SS-25. The developers placed the following tenets at the basis of working out the strategy for the project: objective conditions established in the services market; ensuring maximum continuity of scientific and production activities of enterprises and, consequently, preserving their intellectual and production potentials; accomplishing tasks with a maximum return in minimum time periods by using amassed experience.

Let us examine the objective conditions. In recent years, due to the successes achieved in miniaturization of satellite equipment, a direction in their improvement known as "Light Sats" has developed significantly. Relatively simple in design, comparatively cheap, and not requiring large carrier rockets to put them into orbit, these small satellites are increasingly making their presence felt in the most varied fields of science and technology. Among them: information exchange (private and business communications, document circulation between enterprises, and others); monitoring production processes in distributed production facilities (for

example, the mining and transporting of minerals); environmental protection; monitoring freight traffic in transportation; obtaining ultra-pure materials and biological preparations in conditions of microgravity.

These satellites weigh less than 1 tonne and are launched to an altitude of up to several hundred kilometers. Using heavy carriers such as the Proton, Ariane, and Delta becomes economically unprofitable for such payloads and orbits. In addition, due to the specifics of using such small satellites, associated with the efficiency of their launch and also the possibility of creating on their basis systems for performing tasks of a regional and global nature, the launching complex for orbital injection must be simple to operate and be able to adapt to both the launch conditions and the type of payload.

The systems with the Start and Start-1 carriers, at the basis of which are the technologies of the military SS-20 and SS-25 systems, fully meet the above-listed requirements. Modifications of them, intended for launching peacetime satellites, do not contain any military components, but possess all the advantages of their design concept: transportability, capability of launching from unprepared launch sites, relative simplicity of operation, high reliability, and efficiency of use. Also of considerable importance is the fact that a solid propellant is used as the energy filler. It does not require that complex fueling equipment be introduced into the system and is safe in operation.

Work to create the carrier rocket is divided into two phases. The first phase calls for implementation of the Start-1 carrier with a high degree of development of systems and assemblies on the base rockets. Its launch with an experimental small space-communications system satellite is scheduled for 1992. In the second phase, it is planned to create the more powerful Start carrier rocket. The beginning of commercial operation of the Start-1 carrier rocket and the first launch of the Start carrier rocket are scheduled for 1993.

It should be noted that unlike a "combat" launch over a ballistic trajectory, launching a satellite into a near-earth orbit requires accomplishment a number of specific tasks of program-methods and algorithmic support when developing the ground and onboard control system and functional and design matching of the payload with the carrier rocket. However, all this is not contrary to the maximum continuity of the scientific-technical and production potential which the creators of these systems possess. This is evidenced by the process of preparing for the launch by the Start-1 carrier rocket of a new satellite with data-transmission equipment that was designed at the "Elas" Scientific Production Association. This work is to be completed by December 1992 in an unprecedented short period of time (about one year). Special emphasis should be made of the fact that practically for the first time in domestic missile building this is being done on a non-budget commercial basis.

The basis of the system is a multistage, controllable, solid-propellant carrier rocket which, depending on the

requirements imposed and the particular operating features of the satellites, supports their orbital insertion in two ways: direct insertion into a circular orbit; insertion into a staging orbit over a sub-orbital trajectory with subsequent provision of the satellite's necessary parameters by its own means. There is a special adapter module for the satellite. Depending on the size of the satellite, the adapter module can be modified, taking into account the limit on controllability of the rocket in the launch phase.

A particular feature of the Start-1 system is its transportability, which makes it possible to execute a launch from any area, including an area not prepared in an engineering respect. Everything needed is self-contained: aiming system, power supply, and the necessary mechanical and transporter-erector equipment.

The system contains specialized service and launching areas for operation and launch of the rocket. Assemblies and equipment of the first area support loading and unloading operations with the rocket and ground equipment, transporting the rocket and system components, technical servicing of the system, connecting the space vehicle to the carrier rocket, comprehensive testing of the rocket, and a number of other operations. The launching area includes the launching stand and the launch preparation post. Assemblies of the launch area support delivery of the rocket to the launch site with the space vehicle attached, pre-launch preparation, and launch of the rocket.

In the process of work associated with using the Start rocket-space system, the following basic issues are to be coordinated: characteristics of the carrier rocket launch areas, the flight orbits (trajectories) of the space vehicles, the requirements for precision of orbit insertion and for drop areas of separated parts of the carrier; coupling the payload (configuration, mechanical, electrical, operational, functioning) with the carrier rocket and ground equipment assemblies; schemes for operation of the system in all transit phases of the equipment being used; organizing international monitoring of the system as being used exclusively for peaceful purposes; protecting the system in all phases of operation; the procedure for coordination of the parties in the process of creating and operating the system; the content of documents governing the obligations of the parties and also the economic, legal, and commercial aspects of creating and implementing project.

Basic Technical Characteristics

Carrier Rocket	Available Volume for Payload, cubic meters	Range of Payload Weight, kg	Range of Circular Orbit Altitudes with Inclination of 90, km
Start-1	1.3	320-550	400-700
Start	7.8	600-750	400-700

The profitability of the project and its competitiveness are ensured by the perfected nature of the designs for key components, the assimilated nature of series production,

and the relatively low production cost and high reliability demonstrated when implementing the procedure of destroying SS-20 missiles by the launch method. All 72 launches were successful, and the figure is even more impressive when combined with previous launch statistics for these missiles—approximately 250 trouble-free launches. This indicator is unprecedented in the experience of world missile building!

Another problem must be noted that is associated with creating Start-I systems—keeping the work on them in line with international agreements. The 1987 INF Treaty between the USSR and USA did not provide for the possibility of using parts of destroyed missiles for peaceful space purposes. It was possible to solve this problem in the Treaty on Strategic Offensive Arms, and the details of its implementation are the subject for coordination at the joint commission for observance and inspections.

Creating rocket systems for launching small satellites in the interests of science and the national economy and using as their basis military technologies are a real conversion about which much can be said. The result of such work will not be slow in coming—this is a long-term program not associated with conditions of the military production market and which makes it possible to use with the maximum economic effectiveness the scientific-technical and production potential of defense sectors of industry for the national economy.

COPYRIGHT: "Tekhnika i vooruzheniye", 1992

MiG Plant Contracts to Build Civilian Aircraft

93UM0259B Moscow ROSSIYSKIYE VESTI
in Russian 24 Nov 92 p 2

[Exclusive TASS interview with Vladimir Mikhaylovich Pomolov, director of the Sokol plant, by ITAR-TASS correspondent Evald Kessariyskiy under the rubric "Conversion": "Can the Sokol Fly With One Wing?"]

[Text] Nizhny Novgorod—A "sokol [falcon]" with one wing is how one test-pilot for the famous MiG-29 and MiG-31 fighters described his enterprise, the Sokol aircraft plant in Nizhny Novgorod. The conversion, the market and privatization have become a stumbling block to this, our leader in aircraft construction.

How does the labor collective at the enterprises intend to escape the economic turbulence, get out of its spin and enter the reform space? Plant director Vladimir Pomolov answers these and other questions in an interview with ITAR-TASS correspondent Evald Kessariyskiy.

[Kessariyskiy] Vladimir Mikhaylovich, has the conversion not been a disappointment for the plant?

[Pomolov] Perhaps this sounds drastic, but it turns out that conversion is just a step away from diversion. As a matter of fact, while the Union government previously somehow planned for the reduction of military orders, the Russian leadership informed us in January that no

one intended to buy our aircraft. We were surprised to hear that suddenly no one needs the modern interceptors. Since the aircraft were already being assembled, however, we continued with trepidation and risk to turn them out. We were finally given the specific figures for military orders: 12 percent of last year's total.

At the same time international air shows in which we have participated have shown that there is enormous interest in our MiGs. So we should sell them for foreign exchange. The MVES [Ministry of Foreign Economic Relations] will not even let us go near this process, however. The possibility is not ruled out that when we find buyers, there will be no aircraft to sell.

[Kessariyskiy] I believe that you formerly sold your fighters to the socialist countries and the developing nations, did you not?

[Pomolov] Yes, we sold around 50 aircraft in recent years. I shall cite an example of how profitable this is. Each MiG-29 we sold last year produced a return of 4-5 dollars for each ruble invested in it.

We are in an extremely difficult economic situation today. Loans, debts, regular disconnections of the gas, water and electricity. We have operated with borrowed money this entire year, paying large interest. We borrowed 2 billion rubles. Our debts are even greater, though: 2.5 billion. We have a chronic shortage of working capital and of profits for maintaining the social services. We are staying afloat exclusively with loans. It is difficult to get out of the morass of debt.

[Kessariyskiy] But surely you are doing something to save yourselves. Selling stocks could help to stabilize the operation, for example.

[Pomolov] We decided at a meeting of the labor collective not to sell stocks for now—temporarily, of course, until next spring. We are looking for our own way, one acceptable only to us. We have reached the conclusion that the sudden selling of stocks just because it is in vogue would not be advantageous. We are afraid that the new owners would get rid of a certain part of the work force for the sake of profitability, while the remaining workers would be a hired work force only remotely benefiting from the profits. We ourselves intend to set up individual and group privatization accounts and use all our resources to accumulate funds to buy a controlling interest. We want to acquire licenses to sell MiGs abroad. We are also beginning to produce passenger planes.

[Kessariyskiy] Exactly what kind?

[Pomolov] A contract has been signed with an Italian firm for the assembly of 100 four-seater Delfin S15S planes for businessmen. The six-seater Gzhel designed by specialists with the Special Design Office imeni V. Myasishchev has also gone into production. We shall begin testing it next year. Local designers have submitted the general-purpose Tingo aircraft to us. It can carry eight people and can land

on any level surface, even water or snow. We also have contacts with Swiss and German firms.

There is one other area. It involves cooperating with the Nizhny Novgorod TsKB scientific production association on hydrofoil vessels. Using their technical specifications, we have begun assembling the Volga-2 hydrofoil, which develops a speed of up to 120 kilometers per hour and functions like a surface-effect vehicle. This vessel could be used as a river taxi, an emergency vehicle or a patrol boat.

[Kessariyskiy] And how has the labor collective reacted to this restructuring?

[Pomolov] People responded with sympathy when we had to retire two and a half thousand workers, as an example. We can maintain the status quo until the new year. After that, if we do not receive state orders for military products, we shall have to lay off 6,000-7,000 workers. And this is a difficult thing to do. Furthermore, I am confident that Russia will need our aircraft. Particularly, since our design development has not been standing still. Work on new supersonic fighters continues. A prudent combination of the two areas, military and civilian, in aircraft construction is the kind of conversion which will suit everyone.

Hopes for Marketing RD-170 Rocket Engine Abroad

93UM0220A Moscow ROSSIYSKIYE VESTI
in Russian 25 Nov 92 p 3

[Article by Valeriy Andrianov: "Milk Instead of Missiles? There Is a Market Called 'Space'"]

[Text] News about the launch of the first space sputnik by the Soviet Union put America into a state of shock. The government was compelled to increase appropriations for military purposes and the word "eggheads" with which they scornfully teased scientists disappeared from the lexicon of rank and file Americans. The race after the latest technologies has not ceased for even a single day since that time. And that is one of the few spheres where the United States and not Russia has played the role of catch up. Today, 30 years later, they still have not caught up with us...

"Energomash" NPO [Scientific Production Association], that is located in the Moscow suburb of Khimki, is reliably protected from excessively curious glances by a high fence and a strict system of protection. This is one of the leading brain centers of domestic missile production. Previously even the very thought of the appearance of foreigners at that secret design bureau would have seemed to be seditious. Today "Energomash" sells its products abroad. Recently the leaders of the NPO and the American company Pratt and Whitney signed a "marketing agreement" in Washington. It provides for entry sale of rocket engines and developments based on them onto the American market. As we all know, markets for the latest technologies have long ago been firmly divided. In order to gain access

to the market, an innovator needs long arms and strong teeth. You need an enormous network of highly skilled and highly paid specialists-managers. Pratt and Whitney, which is among the U.S.'s leading rocket manufacturing firms, has all of that. And "Energomash" has something to offer on the American market.

Specialists are certain that this will primarily be a question of selling our RD-170 rocket engine. There is no similar engine to it in the world. For comparison—the RD-170's thrust is four times greater than Rocketdyne's engines that have been installed on the American Space Shuttle. And experts admit that neither France nor the United States will be capable of developing an engine to compete with the RD-170 even in 5-10 years.

Does the sale of this engine signify a rejection of a leading position in rocket manufacturing? No, this is the beginning of a long and intense struggle for a sales market. And it will be much more difficult to be victorious in it then to maintain the security of the latest technological secrets. According to "Energomash" Deputy General Director for Marketing V. Sigayev, the years of work of union and republic ministries did not produce any concrete results with the exception of the commercial launch of an Indian satellite. Many people are interested in our equipment but in order to sell it we need to overcome dozens of economic, political and legal barriers. Many of the West's rocket manufacturing firms want to sell their products and the space powers seek licenses to launch satellites. Having gone ahead of everyone else by 5-10 years in the technical context, we are bringing up the rear in the commercial sphere. The agreement between "Energomash" and Pratt and Whitney is the first attempt to make up for what was lost. The profits of the parties that were stipulated in the "marketing agreement" are a commercial secret. But world prices for space engines are well known—for example, they cost about \$50 million for the Space Shuttle. So, the agreement will not only provide salaries for the association's 12,000 workers but will also yield millions of dollars in profits for the enterprise. The "Energomash" leadership already has a utilization program for these resources. "The main thing that our NPO will receive is the capability to survive under the current conditions," thinks V. Sigayev. "We will completely utilize our production capabilities and we will begin a conversion program. The association plans to produce separators for milk plants and heaters for grain dryers." Right now people are thinking more about bread and milk than about rockets. Although the NPO will fundamentally help the milk industry with its developments, primary production will not lose anything from that. On the contrary, thanks to the agreement the association will gain access to American equipment and will possibly acquire equipment for test stands. Since "Energomash" ceased being a secret enterprise, delegations of specialists have visited from the United States, Japan, France, Italy, Sweden, and Israel. But, as a rule, it has ended with a thanks for the opportunity to visit the association. Pratt and Whitney was the first to decide on such a bold step. They managed to convince the American side that exports from Russia would not result in a loss of

jobs and the American side convinced the Russian side that the engines will be used for peaceful purposes. The door to the American market has been opened. Will we manage to enter?

Simonov Discusses Problems of Sukhoy Design Bureau

93UM0298A Moscow NEZAVISIMAYA GAZETA
in Russian 17 Dec 92 p 6

[Interview with Mikhail Simonov, general designer for the Public Design Bureau imeni P.O. Sukhoy, by Mikhail Chernyshov: "Mikhail Simonov: Only Superaircraft Can Be Offered in the Western Market"; first paragraph is NEZAVISIMAYA GAZETA introduction]

[Text] The aircraft industry of Russia is going through a very difficult period. Despite endless conversations about the need to carry out well-conceived conversion programs, the production of combat aircraft is declining dramatically. This reduction is not being compensated through a greater output of civilian aircraft. So what is really happening with conversion? Is it working? Or is this word now being used to denote a general collapse of the defense industry?

"I do not agree with those who assert that conversion is not working," says Mikhail Simonov with irony. "... is working and how! Especially if it is treated the stopping of military production or the transition to a partial work week. Huge enterprises with thousands of highly qualified workers are remaining without work. There are now many such enterprises. Even too many. Our collective is in a somewhat better position in comparison with others primarily because we were able to find a place in the market. This applies to foreign trade in particular. The difference between the Western market and ours is that there, figuratively speaking, you can buy everything and sell nothing, unless, of course, you offer a superior commodity. Fortunately, our output is being sold. The general opinion is that the Su aircraft are comparable with the latest technology of the leading Western firms and are even superior in some parameters. This applies to military as well as sporting aircraft."

[Chernyshov] But the Western press did not always write about the Su aircraft as being excellent.

[Simonov] We read the foreign aviation journals and we know about this. As strange as it may seem, however, at a certain stage this disinformation suited us quite well. We were in no hurry to dissuade the West and deprive it of pleasant illusions. There was no need to advertize our achievements, for we had no marketing problem. The situation has changed dramatically in recent years. At various international exhibitions and air shows, we strive right along with Western states to show the merits of our aircraft. And, as they say, everything finds its place.

In Farnborough (England), we demonstrated for the first time the sporting and acrobatic aircraft Su-26 and Su-29. They currently enjoy great popularity with sportsmen. The aircraft sell well abroad—in the United States, England,

Switzerland, and other countries. There are 20 orders for the current year and approximately another 120 orders through 1995. Today the Su aircraft have turned out to be a good commercial puller, helping to earn foreign exchange for the plant. But so as not to miss the market, it is necessary to improve technology constantly and to use the latest materials. And, of course, one must monitor the quality of the work. Recently they painted one of the aircraft poorly and the customer sent us a "Cadillac" so that we would have a standard for quality.

They showed the Su-35 at the latest show in England. This aircraft is not yet on line. The aircraft must be tested for spin and it must be demonstrated that it is safe for flights at minimum altitude. Still, we brought the aircraft to the exhibition, although its stellar hour will probably not come for another year, at the next exhibition "Burge-93" in Paris.

Analogously, at Farnborough we demonstrated the prototype of an aircraft with frontal horizontal empennage. The Americans have a similar aircraft, the F-15 STOL, but they came to a standstill in the ultimate stage. We advanced significantly further. The aircraft has not completed special demonstration flights. It simply flew to Farnborough and back, showing that it is capable without landing of covering the distance from Moscow to London with a large reserve. We link this aircraft with great commercial hopes.

[Chernyshov] One of the key questions in the problem of conversion is that of the sale of arms—combat aircraft in the case at hand—in the foreign market. In Russia, there are rather influential social and political forces that insist that dealing in arms is immoral, that it does not bring any benefits, and that hence one should renounce it entirely. As a result of such propaganda, Russia has lost the parity that it had with the United States in the sale of arms. What can be said about this position?

[Simonov] I think that it is necessary to abandon the demogogy and calmly face the problem. The world market is not experiencing any shortage of arms. As soon as we refuse a sale to someone, an offer immediately follows from some other side. The Americans received and will receive tens of billions of dollars from the sale of F-16's to Turkey and Taiwan, whereas we, having reduced our trade in arms, have punished our own country in the amount of those same tens of billions of dollars, despite the fact that we buy grain and food products with dollars. Economists have calculated that tens of billions of dollars are now needed for conversion. Where can we get the foreign exchange? Should we continue to send raw materials abroad? Or perhaps it is nevertheless better to trade in high technologies, into which many billions were invested a long time ago, long before the reform? Whether or not this is advantageous can be seen quite well in the example of the export of those Su aircraft. When we sell sporting machines for dollars, we receive 12 times as much per ruble than we

do under the current rate of exchange of rubles for dollars. And we receive more than 120 times as much for a combat aircraft.

There ought to be less "high politics" in trade and more common sense. We were forbidden to deliver a batch of fighters to one of the countries. The argument was this: we should not ruin our relations with a neighboring country. And besides that, we owe it several billion dollars that it will immediately demand. Good! We refused to sell the arms. But no sooner had we refused the sale when the Americans delivered the fighters to that country. As a result, we suffered a double loss. Because if we had sold the arms, then the contiguous country would immediately have bought our aircraft to balance the situation. And we could have calmly delivered combat aircraft instead of dollars to pay back our debt. What should we call such "high politics"?

[Chernyshov] Who in principle ought to deal with the sale of aircraft? For at the present time many departments are vying for this: the former Ministry of Foreign Trade, military departments, producing firms.... And there are endless mutual accusations of incompetence, dumping, and other sins. In addition, the departments are beginning to fight each other in the foreign market. Where is the effective way out?

[Simonov] The developer and producer must sell the output together! Over the decades of our foreign trade practice, a system developed in which the former allied representatives abroad very frequently sold equipment of quite good quality for ridiculously low prices for their personal benefit. But now we are being accused of not knowing the market conditions and of being incapable of dealing. That is not so at all. We know the market conditions very well and are quite capable of organizing the training of dealers and the operational maintenance of equipment. I am not in favor of eliminating the department of Petr Aven. There must be coordination and state guidance in foreign trade. But we must work harmoniously on behalf of the common goal rather than tripping each other up.

[Chernyshov] Is much foreign exchange going directly to the enterprise?

[Simonov] In general, it is just crumbs. They are supposed to sell half of the foreign exchange to the state immediately. They have to pay customs duties, NDS [expansion not given], and taxes on profits. And there is also downright theft. When we first started foreign trade activities five years ago, we decided to keep money in Singapore so as not to be moving it back and forth around the world, for that also leads to a loss of foreign exchange. Through his well-known directive, President of the USSR Mikhail Gorbachev forced us to transfer the foreign exchange to USSR Vneshekonombank. As law-abiding citizens, we transferred the money to Moscow. And shortly thereafter we learned that someone had already spent it. In the West, they put bankers behind bars for this. And now they are telling us that we can take

N.I. Ryzhkov to court, because that occurred under his instructions. There you have the law-governed state.

And one other thing. In trading in the foreign market, it is natural to want to increase the flow of foreign exchange into the country. But how can this be achieved? By raising prices? This will strangle and constrict the market.

Then at our own risk, after analyzing business conditions, we reduced the price for sporting aircraft by 20 percent. And what happened? Exports increased by a factor of eight and the influx of foreign exchange by a factor of six.

[Chernyshov] Conversion, market.... Does this somehow change the situation at the enterprise?

[Simonov] There have been many changes. Take the assembly of sporting aircraft. Our defense plants never had a product of such paramount importance. Today assemblers here receive the highest wages—as much as 15,000 to 20,000 rubles [R]. Wages are lower at other (military) assembly plants. Today we have no shortage of personnel. We have the possibility of choosing some assembly sections or others with the most qualified workers and specialists. Moreover, being concerned about the replacement of engineering personnel, this year we will pay out scholarships imeni P. Sukhov of about R2,500 each to 200 of the most capable students at technical higher technical institutions—this is in addition to their regular scholarships.

The situation in administrative structures has also changed. Department heads now do not merely receive salaries and bonuses but must earn their money. How? Well, let us suppose that one state decided to carry out some work to increase a resource involving our technology and to pay us for this in rubles. Our specialist goes there and seeks payment in hard currency at the prices prevailing in the world. We think that in this case some percentage of the contract sum is adequate remuneration for this specialist. But our finance workers and controlling agencies are not accustomed to this. How is this? This is "crazy money" and in foreign exchange at that! Impossible! And no one considers that an individual had the initiative to provide work and capital for a large collective. Well, if not in dollars, pay in rubles. There must be some incentive. Otherwise how can you work? Well, in general, the main task today is to privatize the enterprises. Why do we consider it important to auction and privatize a large part of the enterprises of the defense industry expeditiously and resolutely? Precisely because this will make it possible to convert the enterprises of the defense industry in a very short time and with minimum losses.

[Chernyshov] Are you emphasizing only aviation technology? Or are there some other objectives?

[Simonov] We can build aircraft and nothing else with the equipment that we have. Our rigging and machine tools focus only on this. It is a very great stupidity if today a plant turns the barrels of weapons and tomorrow they

force it to make meat grinders. On the other hand, however, we understand very well the importance of expanding our products list. What products? Only those having to do with high technologies. No firm in the West is shifting from missiles to children's sleds. Today motor vehicles and tractors are among the most profitable items of civilian production. We cannot independently make a good motor vehicle—this takes decades. And, as was already mentioned, there is nothing you can do in the market with a bad motor vehicle. For this reason, there are plans to cooperate with some Western firm that is a leader in the building of motor vehicles or tractors and to come out immediately with a competitive product. We are referring, in particular, of the English firm "Rover." It produces the world's best cross-country vehicles.

Analogously, we also want to master the production of tractors. At the present time, as strange as it may seem, many farmers in the West are returning to the idea of the MTS—the machine and tractor station. That is, they prefer not to buy but to lease machinery for plowing or other work. For this reason, sufficiently powerful 150-hp tractors are becoming fashionable. But this tractor must differ fundamentally from what our industry produced. It needs a soft suspension of the cabin so that the soul is not shaken out of the driver while plowing. It requires air conditioning and turbosupercharging, as in aviation, for accelerated work. And it needs a speed of 80 km an hour on the highway so that it can reach the required field more quickly and not delay the movement of others.

NAVAL SYSTEMS

Production of Naval Propulsion Systems at NPO 'Mashproyekt'

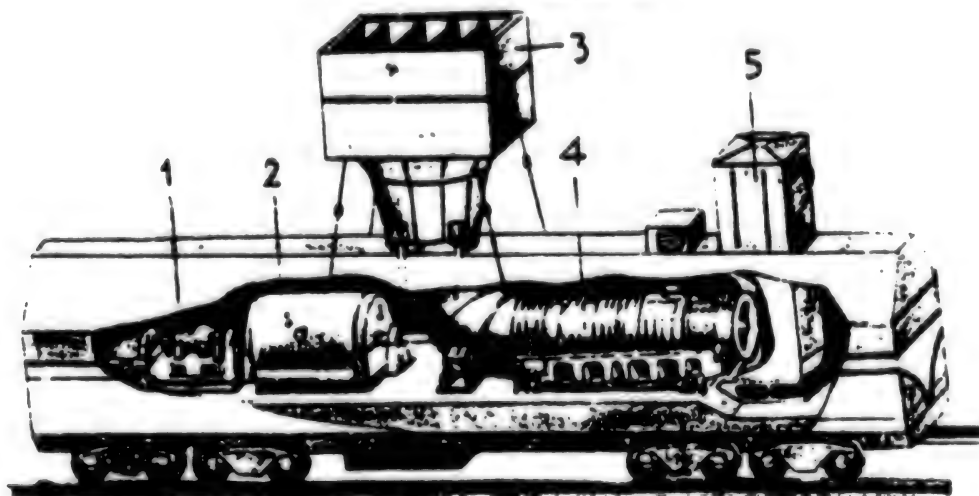
93UM0232A Moscow *TEKHNIKA I VOORUZHENIYE* in Russian No 9-10, Sep-Oct 92 (signed to press 26 Aug 92) pp 2-4

[Unattributed article under rubric "Science-Engineering-Progress": "Steam Power Plants"]

[Text] For over 35 years NPO Mashproyekt has been working to create gas turbine engines and plants for various purposes. Their series production is accomplished by PO Zarya. This product is well known to navymen. Engines are being successfully operated on guided missile cruisers, large ASW ships and surface effect ships. The engines have automated control, monitoring, regulation and protection systems both with autonomous as well as group operation. They are outfitted with technical diagnostics equipment permitting the condition of assemblies to be assessed in operation.

The Association also has created engines for delivering natural gas through gas mains. Special demands are placed on these units, one of which is lengthy, uninterrupted transportation of gas under high pressure. Natural gas coming directly from the gas pipeline is used as fuel. Many years of experience in operating engines at gas pumping stations confirmed their reliable operation.

Mayak railway power plant:



Key:

- 1. Auxiliary equipment
- 2. 4 megawatt generator

- 3. Exhaust device
- 4. GTD DO12 gas turbine engine
- 5. Air inlet

Lately Mashproyekt specialists have been giving great attention to modular design and especially standardization of their assemblies. A solution to this problem also means an opportunity to perform equipment maintenance and repair with minimum time expenditures.

The engine designs use titanium and nickel alloys and heat-resistant and high-temperature chrome-nickel and chrome-molybdenum steels. The configuration of main parts permits applying precision forming methods.

NPO Mashproyekt gas turbine plants are finding more and more use in the national economy. The Severnoye siyaniye floating power stations on which powerful engines developed by Mashproyekt specialists are installed have been operated for more than 30 years now in hard-to-reach Far Northern areas. The high mobility of power plants and large total power (over 20 megawatts) of gas turbine generators permit using them to supply electrical power to major industrial installations.

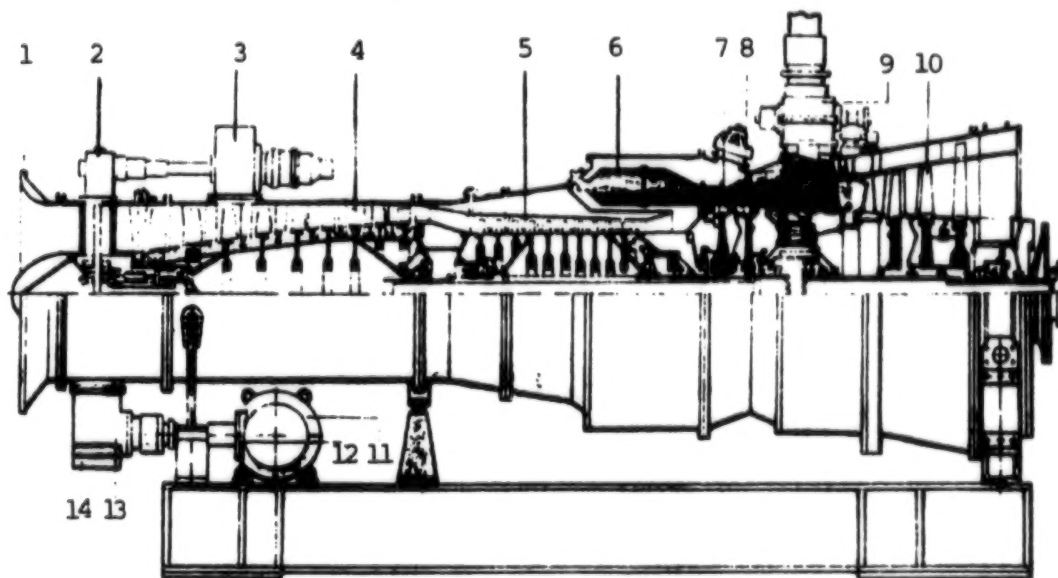
Since 1974 Mashproyekt specialists have been using the 4 megawatt DO12 ship gas turbine engines they developed for use in railway mobile power plants. Nineteen such railway power plants presently are supplying electrical power and heat to undeveloped, hard-to-reach areas remote from central power systems, including to space launch complexes.

NPO Mashproyekt presently has created new types of third-generation ship gas turbine engines distinguished by high indicators of economical operation and reliability and by weight-size characteristics. One of the last new items is the GTD 15000 gas turbine engine. This unit can be installed both fixed as well as on a railroad flatcar or floating platform. Together with the electric generator it forms a compact electric power station.

The GTD 15000 gas turbine engine combines in itself a gas generator and power turbine. The gas generator has low and high pressure axial-flow compressors rotated by two independent turbines, and a loop-type can-annular combustion chamber. Nine high-pressure compressor stages provide a 20-times increase in air pressure. A rotating inlet vane device is used to improve compressor operation both in the starting mode as well as in a wide range of engine loads. The high and low pressure turbines are single-stage. Their nozzle units have internal convective air cooling. The combustion chamber is formed by 16 sectional flame tubes with fuel-injection nozzles and with internal and external casings.

The GTD 15000 gas turbine engine was designed using the latest computer methodologies of gas-dynamic and strength calculations. The optimal nature of design solutions has been tested and confirmed in the process of individual-assembly finishing of component parts and lengthy prototype tests. Twenty-five technical solutions are protected by author's certificates and one of them,

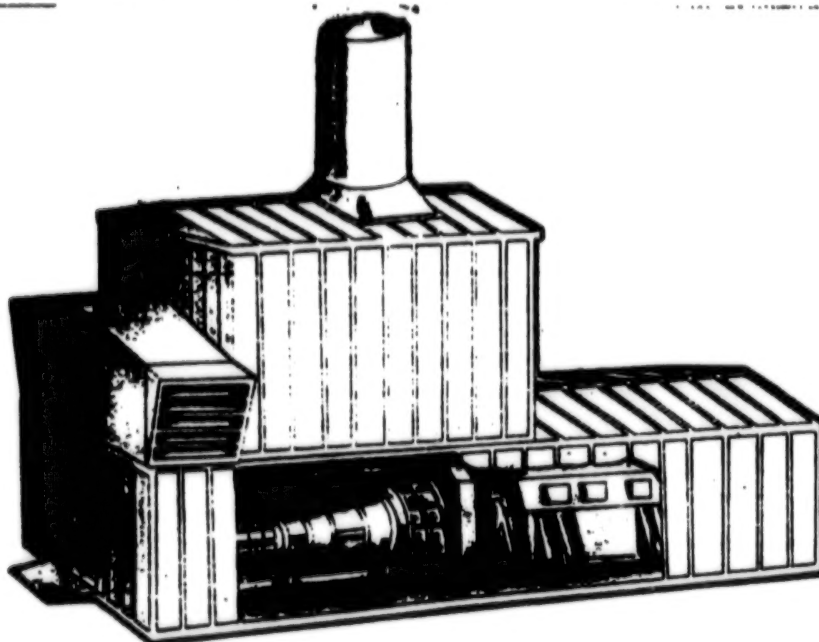
GTD 15000 gas turbine engine (exterior view [not reproduced] and design diagram):



Key:

- | | |
|-----------------------------|-------------------------|
| 1. Inlet | 8. Low-pressure turbine |
| 2. Drive of upper drive box | 9. Reversing mechanism |
| 3. Upper drive box | 10. Power turbine |
| 4. Low-pressure compressor | 11. Electric starter |
| 5. High-pressure compressor | 12. Remote drive box |
| 6. Combustion chamber | 13. Lower drive box |
| 7. High-pressure turbine | 14. Oil unit |

NPO Mashproyekt and PO Zarya offer the EG15U 15 megawatt automated power plant with GTD 15000 gas turbine engine, steam waste-heat loop and overall efficiency up to 82 percent.



the gas reverse device principle, has been patented in the United States, England, Japan and the FRG.

NPO Mashproyekt and PO Zarya offer the manufacture and delivery of GTD 15000 gas turbine engines as well as services for developing gas turbine units with waste-heat recovery according to client specifications. The makeup of the gas turbine unit may include one or more engines, reduction gear, compact waste-heat boiler and other devices supporting plant operation.

Also offered is the 15 megawatt EG15U automated power plant with GTD 15000 gas turbine engine and steam waste-heat loop (efficiency up to 82 percent).

Address for inquiries: 327018, Ukraine, city of Nikolayev, Oktyabrskiy pr., 42a, NPO Mashproyekt.

Telephone: 22-13-48. Telex: 27-21-36.

COPYRIGHT: "Tekhnika i vooruzheniye", 1992

Conversion: Navigation Institute

93UM0266A St. Petersburg NEVSKOYE VREMYA
in Russian 20 Nov 92 p 2

[Article by Olga Kuznetsova: "It Was Silly to Keep Us in the Background"]

[Text] Passing through the streets of St. Petersburg, we scarcely pay attention to many institutions whose entryways have no plaques or signs explaining what department is located there. One such anonymous building is

located on Vasilyevskiy island, not far from the Harbor. But just recently a sign was hung up: NINGI MO RF, which means Scientific-Research Navigational-Hydrographic Institute of the Minister of Defense of the Russian Federation.

I was the first newspaper person to cross the threshold of this institute, which on the inside is more reminiscent of a military unit than a scientific research institute.

Practically all national research in the field of navigation and hydrography has been concentrated here for dozens of years, on the corner of Bolshoy Prospekt and the Kozhevennaya Line. Here they developed and improved the onboard apparatus now in use (and not only by the military) without which not a single modern vessel would brave the open sea, and also the means for navigational equipment of sea routes and ports, and hydrographic and hydrometeorological equipment. It was within these walls that a system was developed for determining the location of ships and other objects using artificial satellites. Even UFO-ology was within the field of research of the institute, and for many years they accumulated a lot of material here in this field. An enormous intellectual potential is concentrated at the institute: dozens of specialists have been awarded scientific degrees, and it has its own doctoral council.

It is a secret to no one that such scientific institutes, subordinate to the military department, are not going through the best of times now. Many institutes have had their financing cut, and the threat of closure looms. This has also affected NINGI. But finally it became clear to its

leadership that if the institute was to survive, it had to emerge from the underground, since not only the military requires navigational equipment. But in the words of the deputy chief of NINGI, Captain 1st Rank Sergey Alekseyev, the traditional curtain of secrecy surrounding the institute did not allow it to openly use its scientific potential and rich data bank, the results of all national hydrographic expeditions since the twenties. According to existing instructions, scientists of the institute could not contact colleagues from other scientific institutions, and frequently there was duplication of research into the identical areas by civilians and the military. "It was silly to keep us in the background," Sergey Alekseyev believes.

But the process of conversion, part of which was liberation from the fetters of excessive secrecy, which recently has seemed to be simply an anachronism, has also touched NINGI. A year ago the decision was made to hold a scientific and technical conference at the institute, to which all interested parties could be invited, chiefly civilian organizations. And this conference "The

Modern Status and Problems of Naval and Air Navigation" was a success. Three hundred specialists, representing the major scientific organs and industrial facilities of Russian, the CIS countries and the Baltics countries, for three days they shared their experience and became acquainted with the latest developments, for which an exhibition of new technical equipment was arranged.

Since the development of navigational equipment is a very science-intensive task, requiring great financial expenditures, commercial organizations were also invited to the conference. One of them, "Tranzas marin," has already concluded a contract with NINGI.

Now the institute is faced with a global task: creation of a federal radio-navigation plane for Russia which combines all information on navigation, marine as well as air and ground navigation. One hopes that by uniting its efforts with other civilian and military institutes, NINGI will successfully accomplish this task.

END OF

FICHE

DATE FILMED

5 FEB 1993